CHRISTIE MICROTILES™

USER MANUAL

020-100329-12

CHRISTIE

CHRISTIE®

MICROTILES™

USER MANUAL

020-100329-12

COPYRIGHT
© 2009-2014 Christie Digital Systems USA, Inc. - All rights reserved.
This document contains proprietary information of Christie Digital Systems Canada, Inc. and Christie Digital Systems USA, Inc., and may not be reproduced, stored in a retrieval system, transferred to other documents, disclosed to other manufacturers, or used for manufacturing or for any other purpose, in whole or in part, without prior written permission of Christie Digital Systems, Inc. Every effort has been made to ensure accuracy, however in some cases changes in the products or availability could occur which may not be reflected in this document. Christie Digital Systems USA, Inc., reserves the right to make changes to specifications at any time without notice. The information furnished in this publication was believed to be accurate and reliable. Christie Digital Systems USA, Inc. makes no warranty of any kind with regard to this material, including, but not limited to, implied warranties of fitness for a particular purpose. Christie Digital Systems USA, Inc. shall not be liable for errors contained herein or for incidental or consequential damages in connection with the performance or use of this material.

TRADEMARKS
All brand names and product names are trademarks, registered trademarks or trade names of their respective holders.

FCC
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
FCC/IC RF Radiation Exposure Statement:
This equipment complies with FCC/IC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada
이 기기는 업무용 (A 급) 으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이점을 주의하시기 바라며 , 가정 외의 지역에서 사용하는 것을 목적으로 합니다
당해 무선설비기기는 운용 중 전파혼신가능성이 있음 .
Contains FCC ID: XU6-CRMX100
Contains IC: 8691A-CRMX100

NOTICES
Manufacturing facility is ISO 9001 and 14001 certified. Performance specifications are typical, but may vary depending on conditions beyond Christie's control such as maintenance of the product in proper working conditions. Performance specifications are based on information available at the time of printing. The equipment is designed and manufactured with high-quality materials and components that can be recycled and reused. This symbol means that electrical and electronic equipment, at their end-of-life, should be disposed of separately from regular waste. Please dispose of this equipment appropriately and according to local regulations. In the European Union, there are separate collection systems for used electrical and electronic products. Please help us to conserve the environment we live in.

WARRANTY
MicroTiles are a versatile product and can be used in a wide variety of creative customer applications. However, MicroTiles have some limitations which need to be considered to avoid inappropriate uses of the product. The MicroTiles warranty does not cover inappropriate uses of the product. For complete information about Christie's limited warranty, please contact your Christie Dealer. In addition to the other limitations that may be specified in Christie's limited warranty, the warranty does not cover:
(a) Damage occurring during shipment, in either direction.
(b) MicroTiles are lightweight and relatively easy to move and install. However, wear and tear may occur if the product is repeatedly assembled and disassembled, especially if excessive force is used with the removal of screens and installation of vertical screws.
(c) Problems caused by combination of the equipment with non-Christie equipment, such as distribution systems, cameras, video tape recorders, etc., or use of the equipment with any non-Christie interface device.
(d) Damage caused by misuse, improper power source, accident, fire, flood, lightning, earthquake or other natural disaster.
(e) Damage caused by improper installation/alignment, or by equipment modification, if by other than Christie service personnel or a Christie authorized service provider.
(f) Failure due to normal wear and tear.
(g) Damage due to operating beyond the products specified environment. This product is designed to operate in an environment of 5°C to 40°C (41°F to 104°F) and a relative humidity between 35% to 85% non-condensing.
(h) MicroTiles are ideal for indoor, high ambient light environments. Avoid setting up the arrays in environments where the module temperature exceeds 50°C (122°F). This is especially true when exposing the screens to direct sunlight. Layers of the screen assembly will delaminate if exposed to environments where this temperature is exceeded. Prolonged exposure to UV radiation, including direct sunlight, may result in degradation of screen performance over time.
(i) MicroTiles are not weatherproof, and should only be used outdoors if contained in an environmentally controlled enclosure that meets the operating requirements of the product.

PREVENTATIVE MAINTENANCE
Preventative maintenance is an important part of the continued and proper operation of your Christie® MicroTiles™. Please see the Maintenance section of the User Manual for specific maintenance items. Failure to perform maintenance as required, and in accordance with the maintenance schedule specified by Christie, will void the warranty.

Addendum

Translated copies of this document are provided on the CD in the back of this document. The CD may also contain additional product documentation. Read all instructions before using or servicing this product.

本文档的翻译副本在本文档背面的 CD 上提供。该 CD 中还可能包含其他产品文档。使用或维修本产品之前请务必阅读所有说明。

文件背面的光碟提供了本文件的翻譯副本。這張光碟可能另外包含其他產品文件。請先閱讀所有指示再使用或送修本產品。

Le CD au dos de ce document contient des traductions de celui-ci dans différentes langues. Ce CD peut également contenir de la documentation supplémentaire sur le produit. Lisez toutes les instructions avant d'utiliser ou d'entretenir ce produit.

Übersetzte Versionen dieses Dokuments werden auf der CD auf dem Vorsatzblatt dieses Dokuments bereitgestellt. Die CD kann auch zusätzliche Produktdokumentation enthalten. Bitte lesen Sie diese Anweisungen vor der Verwendung dieses Produkts oder vor der Ausführung von Wartungsarbeiten am Produkt.

Le copie tradotte di questo documento sono fornite sul CD, sul retro di questo documento. Il CD potrebbe anche contenere altra documentazione sul prodotto. Si prega di leggere tutte le istruzioni prima di utilizzare questo prodotto o sottoporlo a manutenzione.

このドキュメントの翻訳版がこのドキュメントの裏面の CD で提供されています。CD には追加の製品マニュアルも収められています。この製品を使用したり、機能させたりする前に、すべての指示をお読みください。

이 문서의 번역된 사본이 이 문서 후면의 CD 에서 제공됩니다 . 이 CD 에는 추가 제품 설명서가 포함되어 있을 수 있습니다 . 이 제품을 사용하거나 수리하기 전에 모든 지침을 확인하십시오 .

Copias traduzidas deste documento são fornecida no CD contido na parte de trás deste documento. O CD pode conter documentação adicional do produto. Leia todas as instruções antes de usar ou prestar serviço com este produto.

Перевод данного документа представлен на компакт-диске на оборотной стороне документа. Компакт-диск может также содержать дополнительную документацию по продукту. Перед использованием или обслуживанием продукта ознакомьтесь со всеми инструкциями.

Las copias traducidas de este documento se proporcionan en el CD que se encuentra en la parte trasera. En el CD también puede encontrar documentación adicional del producto. Lea todas las instrucciones antes de utilizar o realizar el mantenimiento de este producto.

Перекладені екземпляри цього документа містяться на компакт-диску, який додано до цього документа. На компакт-диску може також бути додаткова документація до виробу. Перш ніж користуватися виробом або його обслуговувати, прочитайте всі інструкції.

Table of Contents

Product Overview 1

Terminology 1
Safety Warnings and Guidelines 2
How MicroTiles Work 2
System Overview 2
Mechanical Housing 2
Rear Projection Screen 4
External Control Unit (ECU) 4
User Interface Overview 5
Purchase Record and Service Contacts 5
Order Guide 5
Standard Components 6
Regional Acceptance for Y-cords 6
Line Cords for D100 and E100 7
Optional Accessories 8
Discontinued Parts 8

Installation and Setup 11

Safety Guidelines 11
Before Beginning an Installation 11
Installation Guidelines 11
Cabling and ECU Layout and Design 11
Required Tools and Hardware 12
MicroTiles Installation 13
Light Seal Trim Application 13
Mount to Leveling Feet (Optional) 13
Assemble First Row 14
Assemble Second Row 17
Assemble Additional Rows 18
Unpack Screens 19
Install Screens 20
Remove Screens 21
Cable Routing 21
Cooling 21
Connecting Sources 22
Displaying Content 23

Power Distribution . . . 24
Connect to Power . . . 24
Install Power Connection Security Clip . . . 25
Install Y-power Cord Retention Clip . . . 26
Power ON . . . 26
Power Down . . . 26
Disassembling a MicroTiles Array . . . 26

Operation . . . 29

Powering Up the MicroTiles Array . . . 29
If a Display Unit Fails to Power Up . . . 29
Powering Down the MicroTiles Array . . . 30
Status Indicators . . . 30
R100 Remote Control . . . 31
Guide to Keypads . . . 31
Keypad Commands . . . 32
Pairing the Remote to the ECU via the OSD . . . 33
Using the On Screen Display (OSD) . . . 35
OSD Functionality . . . 35
OSD Guidelines . . . 35
Navigating the OSD Menus . . . 36
OSD Source Management Menu . . . 36
OSD Canvas Management Menu . . . 37
OSD Configuration Menu . . . 38
OSD Status Menu . . . 39
OSD Help Menu . . . 40
Using the Web User Interface (WebUI) . . . 41
Recommended System Requirements . . . 41
WebUI Menu Tree . . . 42
Navigating the WebUI . . . 42
WebUI Source Management Menu . . . 43
Adjust Image Settings . . . 43
Change Size and Position of Video Content . . . 44
Customize Extended Display Identification Data (EDID) . . . 45
WebUI Canvas Management Menu . . . 46
Select a Display Mode . . . 47
Layout . . . 47
Canvas Settings . . . 52
Advanced Canvas Settings . . . 55

Display a Test Pattern 57
Wire Map 58
HSSL Info 58
Configuration Menu 59
Power ON/OFF All Tiles 59
Resetting Selected Tile(s) and ECU(s) 59
Set Date and Time 59
Configuring Ethernet 60
Upgrading Main Firmware 60
Upgrade Firmware 62
Correcting a Failed Firmware Upgrade 64
Hardware Upgrades 64
Remote Control 65
Restore Factory Defaults 66
Save & Restore Settings 67
Simple Network Management Protocol (SNMP) 68
Status Menu 70
System Information - ECU 70
System Information - Tiles 71
Help Menu 73

Maintenance 75

Cleaning Procedures 75
Cleaning Inside Screen Surface 75
Cleaning Outside Screen Surface 75
Lens 76
Light Engine Heat Sinks 76
Air Filter 76

Troubleshooting 77

Image problems 77
Hardware errors 78
WebUI Errors 79

Specifications 81

General Specifications 81
Screen Specifications 83
Advanced Specifications 83

OSD Menu Tree 85

Source Management Menu Structure 85
Canvas Management Menu Structure 86
Configuration, Status, and Help Menu Structures 87

CHRISTIE

Product Overview

Christie MicroTiles (MicroTiles) are modular, high-quality image display units with related accessories which, when combined, form large arrays of virtually any size and shape. The modular design uses rear projection, based on a single TI Digital Micromirror Device™ (DMD) and chipset. High-brightness LEDs provide the illumination source. MicroTiles can be quickly and easily deployed into small display configurations, while providing the additional features required for larger and more complex installations.

Terminology

- **MicroTiles:** Refers to some tiles.
- **Tile(s):** Consists of a display unit and a screen.
- **External Control Unit (ECU):** Controls MicroTiles arrays, video input source.
- **Master ECU:** Only one master ECU can be assigned to a canvas. This master supplies the global video source.
- **Slave ECU:** Supplies local video sources in multiple ECU configurations.
- **Canvas:** A group of tiles and ECUs that are connected together electronically. To constitute a canvas, tiles do not need to be physically adjacent to one another. The maximum number of tiles in a canvas is 200, and the maximum number of ECUs is 16.
- **Array:** A group of tiles that are physically connected to each other. A canvas may include multiple arrays. Video sources are mapped to arrays of tiles. Each array represents a new source mapping.
- **Sub-array:** A group of tiles within an array that are configured to display either the local or global video source. A single array may contain multiple subarrays.
- **Media Source:** Provides the source for the input signal.
- **Global Source:** The media source connected to the master ECU also functions as a “global source”. The global source can be displayed on any group of tiles connected to the local source input (HSSL-1) side of the master ECU. In a closed loop canvas, all tiles can display the global source.
- **Local Source:** The media source connected to an ECU as a “local source”, feeding the local set of tiles connected to its local source output (HSSL-2).
- **Open/Closed Loop:** An open loop canvas terminates with the last tile in the canvas, which is not connected back to the first ECU. In a closed loop canvas, the last tile in the canvas is connected back to the first ECU. There are no unused Display Port connections in a closed loop canvas.

Safety Warnings and Guidelines

VISIBLE LED LIGHT
DO NOT VIEW DIRECTLY WITH
OPTICAL INSTRUMENTS
CLASS 1M LED PRODUCT
Maximum Power: 3.61mW 400-700nM
IEC 60825-1:1993 + A1:1997 + A2:2001

When the screen is removed, directly viewing the beam with an optical instrument (for example, an eye loop, magnifier or microscope) from a distance of less than 100mm may pose an eye hazard. MicroTiles is a class 1M source of visible and invisible LED radiation with a maximum power rating of 3.61mW @ 400-700nM.

⚠WARNING Electrical Shock Hazard! Always power down and disconnect/disengage all power sources to the tiles before servicing or cleaning. Read and understand all product safety labels before installing/operating this product.

⚠CAUTION The volume air directly behind each tile must not exceed the maximum operating temperature of the tile, which is 40°C (104°F). A minimum 2" (50mm) gap must be left at the back of each tile to ensure proper air flow and cooling. Each tile has a maximum cooling load of 110W (375 BTUs/hr) per tile, when operating with brightness and color matching disabled (each LED operating at maximum drive level). For detailed information on airflow requirements, see *Christie® MicroTiles™ Specification and Application Guide* (P/N: 020-100334-xx).

How MicroTiles Work

The self-contained mechanical and optical design allows multiple tiles to be stacked together into an array of any size or configuration. Custom electronics allow the array to be completely self-configuring without any external hardware. The video signal to be displayed is fed into the array via an External Control Unit (ECU). This signal is buffered and converted into a high speed (five Gbps) serial stream and relayed to every tile in the array. Each tile captures a portion of the image and applies scaling, as required, which results in a single picture. The ECU also acts as the main system controller and coordinates with all connected tiles to form a canvas.

System Overview

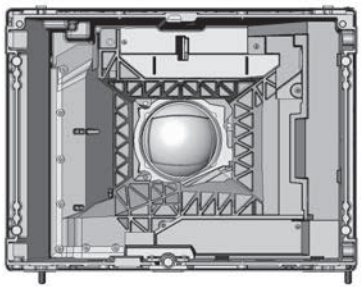
MicroTiles consist of several subsystems, which includes the mechanical housing, screen and Fresnel lens, light engine, Front End Formatter Board (FEFB), IR sensor, internal Low Voltage Power Supply (LVPS) and cooling system. An array of MicroTiles requires at least one ECU (master ECU), acting as a main control unit and input interface for image content distribution through the array.

Mechanical Housing

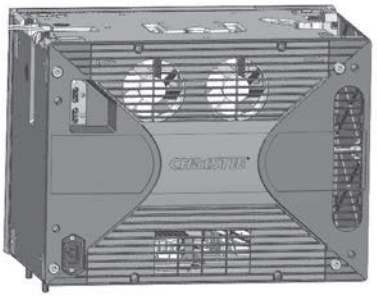
The mechanical housing comes equipped with internal supports, which are designed to support small arrays. For larger arrays, external supports are required. MicroTiles are optimized to operate in an upright, landscape orientation; however, they can be operated in many other orientations, as long as the cooling and support requirements are met. Product cooling and mechanical support is the

responsibility of the end user. For information, see *Christie® MicroTiles™ Specification and Application Guide* (P/N: 020-100334-xx).

Front of Tile (screen removed)

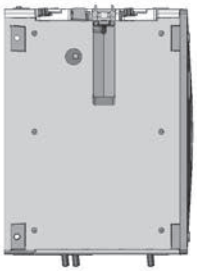


Back of Tile

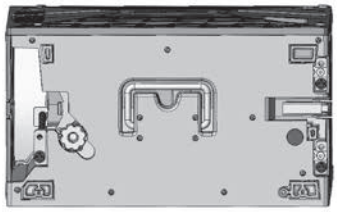


Left Side of Tile

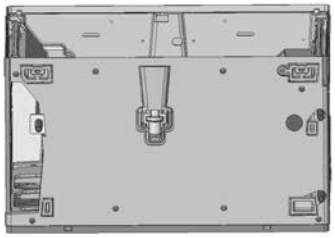
Right Side of Tile



Top of Tile



Bottom of Tile



Rear Projection Screen

NOTICE Do not touch inside of the screen. Always handle the screen from the sides. Remove all jewelry from your hands before handling.

The screen is designed to display high-quality images under a wide range of viewing angles and high ambient lighting conditions. The screen has a matte non-glare front surface that reduces specular reflections from adjacent light sources and maintains the contrast and luminance uniformity of the displayed image. The screen is designed to display a sharp image formed close to the screen edge to allow for image blending from screen to screen when tiled in an array. The screen material has expansion characteristics that are low and closely matched for the screen elements. This allows the screen to retain its dimensions in various operational environments and prevent separation between the screen elements that would induce unwanted image artifacts. The screen is attached magnetically to the housing. The screen can be easily removed by applying suction with a screen removal tool (supplied). In the event that the magnets fail to retain the screen – for instance due to extreme vibration of the housing – an integral tether ensures the screen remains attached to the housing. For proper cleaning instructions, see *Cleaning Outside Screen Surface* on page 75.

External Control Unit (ECU)

NOTICE The Web User Interface (WebUI) is only functional on a master ECU. It does not communicate with slave ECUs.

A MicroTiles array requires an ECU in order to display an image across the entire array. End users connect a PC or media player to the array using a DVI-D cable. The ECU then ensures the supplied video signal is properly displayed across the entire array. For more complex arrays, multiple ECUs can be used.

The ECU is able to communicate with all tiles in the array and with any other ECU using Christie's proprietary HSSL interface. Each tile and ECU has a unique IP address, allowing full communication between tiles and ECUs across the network. The address of each tile is assigned using DHCP. For more information, see *Connecting Sources* on page 22.

In a multiple ECU array, one ECU acts as the master ECU, while all remaining ECUs act as slave ECUs. Multiple master ECUs can occur when an array is powered up with more than one ECU attached. On start-up, all ECUs assume they are the master ECU and begin the self-organization process.When two ECUs encounter each other, one of the ECUs is chosen to be the master ECU. If immediately prior to

the last power down, one of the two ECUs had been acting as the master ECU and the other as slave ECU, then the unit last identified as the master ECU remains identified as such. If both ECUs (or neither) had been the master ECU, then the next level of priority is based on firmware revision, where the ECU with the newest firmware takes precedence.

A sophisticated external software application is also available to clients, which provides a graphical method of viewing the installation where the on screen layout of the MicroTiles matches the physical installation. Users are able to arrange/change the configuration and view the results via the on screen layout of the software. For more information, go to www.microtiles.com and click on **MicroTiles Designer**.

User Interface Overview

MicroTiles incorporate two basic user interface systems; the On Screen Display (OSD) and the Web User Interface (WebUI), which both come standard with the ECU. For the most part, the OSD and WebUI contain the same features and functionality. However, the WebUI is faster to operate, but requires an Ethernet connection, a PC with web browser and an Adobe® Flash Player™ Plug-in. Additionally, the WebUI enables you to update the firmware (firmware/FPGA) and select individual tiles, where the OSD does not. The OSD is accessed via the R100 Remote Control. For more information about the OSD, see *R100 Remote Control* on page 31 and *Using the On Screen Display (OSD)* on page 35. For more information about the WebUI, see *Using the Web User Interface (WebUI)* on page 41. Each interface provides access to MicroTiles configuration, control and diagnostics tools.

Purchase Record and Service Contacts

Whether the MicroTiles are under warranty or the warranty has expired, Christie's highly trained and extensive factory and dealer service network is always available to quickly diagnose and correct tile malfunctions. Complete service manuals and updates are available for the MicroTiles. Should a problem be encountered with any part of the MicroTiles, contact your dealer. In most cases, servicing is performed on site. If you have purchased MicroTiles, keep a copy of the packing slip shipped with your purchase for your records. The packing slip contains the serial numbers for each tile. The serial number can also be found on the license label located on the back of the tiles, as well as on the front chassis.

Order Guide

For a detailed overview of the kits and accessories visit www.microtiles.com.

Standard Components

The items listed in this table will be ordered with every system.

Item	Part Number	Part Description	Details
Display Unit	123-001102-xx	MicroTiles Display Unit D100	Each display unit includes a one meter display port cable, three vertical screws, one power connection security clip (comes installed), light seal trim and two horizontal adjustment screws for fine optimization of screen gaps.
Screen	123-124108-xx or 123-128102-xx	MicroTiles Screen S300 MicroTiles Screen S310	Ordered separately from display unit.
External Control Unit	123-101103-xx	MicroTiles ECU E100	Includes a three meter display port cable.
User Kit	123-103105-xx	MicroTiles User Kit	Includes: R100 Remote Control, screen removal tool, cleaning cloth, screen tape for sealing the corners of the array, *Christie MicroTiles Quick Setup Guide* and *User Manual* (with CD containing additional technical documentation).
Y-cord Kit	123-122106-xx	MicroTiles Y-cord Kit	One kit supports up to nine MicroTiles. This kit includes nine Y-cords with retention clips. This kit does not include regional line cords for connecting a group of tiles to a power outlet. Some regions do not accept Y-cords, see *Regional Acceptance for Y-cords* on page 6. Regional line cords will be shipped separately. See *Line Cords for D100 and E100* on page 7.

Regional Acceptance for Y-cords

NOTICE

Local or national regulations may not allow the use of Y-cords and may require an alternative method of power distribution, such as standard individual line cords for each tile, or power bars. This may include Japan, China, Korea and others.

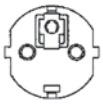
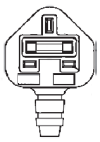
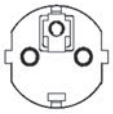
For details about power bars, see *Power Distribution* on page 24 and the *Christie MicroTiles Specification and Application Guide (P/N: 020-100334-xx)*.

For a list of individual line cords available from Christie, see *Line Cords for D100 and E100* on page 7.

The Y-cord Kit (P/N: 123-122106-xx) can be used in the USA, Canada, Mexico, the European Union and Russia. It **does not** include line cords. Suitable regional line cords will be shipped separately by Christie. For a list of line cords available from Christie, see *Line Cords for D100 and E100* on page 7.

Line Cords for D100 and E100

Regional line cords are shipped separately by Christie for the display unit (D100) and the ECU (E100), for the regions listed in the table. This list is subject to change and is for reference only.

Country	C13 Line Cords for D100	C5 Line Cords for E100	Inlet	Receptacle for D100	Receptacle for E100
North America	108-383105-xx	108-384106-xx			
European Union	108-390103-xx	108-391104-xx			
United Kingdom	108-388100-xx	108-389101-xx			
Japan	108-371102-xx	108-376107-xx			
China	108-373104-xx	108-375106-xx			
Korea	108-390103-xx	108-391104-xx			
Australia	108-392105-xx	108-393106-xx			

For all other regions consult with local authorities. Locally approved line cords must be supplied for the tile and ECU.

Optional Accessories

The items listed in this table are optional, but in many cases may be required or recommended. To order additional kits and hardware, go to www.microtiles.com.

Item	Part Number	Part Description	Details
End Foot Kit	123-105107-xx	MicroTiles Foot/Ends (includes left/right end feet and one grille)	Leveling feet are recommended to help level the bottom row when building on a supporting structure. Order one end foot kit per array.
Center Feet	123-106108-xx	MicroTiles Foot/Center (three-pack includes three grilles)	Order one center foot to place between each column.
Mounting Bracket	123-107109-xx	MicroTiles Mounting Bracket (two-pack)	One required for every tile that is added to rows six and above in an array.

Discontinued Parts

Part Number	Part Description	Date Discontinued	Notes
123-102104-xx	MicroTiles Screen S100*	Sept. 30 2011	five year support policy
123-124108-xx	MicroTiles Screen S200*	Sept. 30 2011	five year support policy
123-104106-xx	Setup Kit	Dec. 1 2011	Replaced by Y-Cord Kit (P/N: 123-122106-xx)

It is possible to install S100, S200 and S300/S310 screens in the same array since the physical dimensions and attachment features are identical; however, in most applications the optical difference between the screens will be apparent, especially when viewed at a wide angle. It is strongly recommended that only one screen type is used in a single array.

The items in this table list a sample bill of materials for a floor mounted 9x9 Christie MicroTiles array, which in this example consists of 81 tiles and three ECUs.

Part Number	Part Description	Qty.	Calculation Notes
123-001102-xx	MicroTiles Display Unit D100	81	
123-124108-xx	MicroTiles Screen S300	81	One per display unit.
123-101103-xx	MicroTiles ECU E100	3	The number of ECUs is a design choice and affects the maximum content resolution of the display. For help in determining the number of ECUs, access the online calculator at www.microtiles.com.
123-103105-xx	MicroTiles User Kit	1	One per system.

Part Number	Part Description	Qty.	Calculation Notes
123-105107-xx	MicroTiles Foot/Ends (includes one grille)	1	One kit (includes left/right) per bottom row
123-106108-xx	MicroTiles Foot/Center (three-pack/includes three grilles)	3	Count bottom row = 9 tiles Subtract 1 = 8 joints = 8 feet required
123-107109-xx	MicroTiles Mount Bracket (two-pack)	18	Count above five high = 9 x 4 = 36 tiles
123-122106-xx	MicroTiles Y-Cord Kit	9	Some regions do not accept Y-cords. See *Regional Acceptance for Y-cords* on page 6

The appropriate regional line cords are shipped separately. The items listed below contain an example of a USA order, utilizing the Y-cord kits.

Part Number	Part Description	Qty.	Calculation Notes
108-383105-xx	C13 Line Cord for tiles	9	One per Y-cord kit. For regions where the Y-cord is not accepted, the quantity of line cords required is one per display unit.
108-384106-xx	C5 Line Cord for ECUs	3	One per ECU

Installation and Setup

Safety Guidelines

VISIBLE LED LIGHT
DO NOT VIEW DIRECTLY WITH
OPTICAL INSTRUMENTS
CLASS 1M LED PRODUCT
Maximum Power: 3.61mW 400-700nM
IEC 60825-1:1993 + A1:1997 + A2:2001

When the screen is removed, directly viewing the beam with an optical instrument (for example, an eye loupe, magnifier or microscope) from a distance of less than 100mm may pose an eye hazard. MicroTiles are a class 1M source of visible and invisible LED radiation with a maximum power rating of 3.61mW @ 400-700nM.

⚠DANGER

Electrical Hazard! Up to nine tiles may be connected per daisy chain when hooking up the power supply. This is the maximum power carrying capability of the line cord. Always power down and disconnect/disengage all power sources to the MicroTiles before servicing or cleaning. Read and understand all product safety labels before installing/operating this product.

Before Beginning an Installation

The configuration of an array will vary on the installation; therefore, the following instructions are to be used as a guideline only. Before installing, it is important to fully understand all site requirements and characteristics. This document outlines installations which are no higher than five rows and no wider than 10 columns. For installations exceeding these specifications, see *Christie® MicroTiles™ Specification and Application Guide (P/N: 020-100334-xx)*.

Installation Guidelines

- When constructing any size array always complete the first row and ensure it is flat before continuing with the next row. Do not attempt to construct the array column by column.
- Power up each tile to ensure it is functioning. Check the LED on the back of the tile. A green light indicates power is enabled. Should the tile fail to power up, see *Troubleshooting* on page 77 for more information.
- Do not remove the lens guard from the MicroTiles or dust cap from the lens until the array is constructed

Cabling and ECU Layout and Design

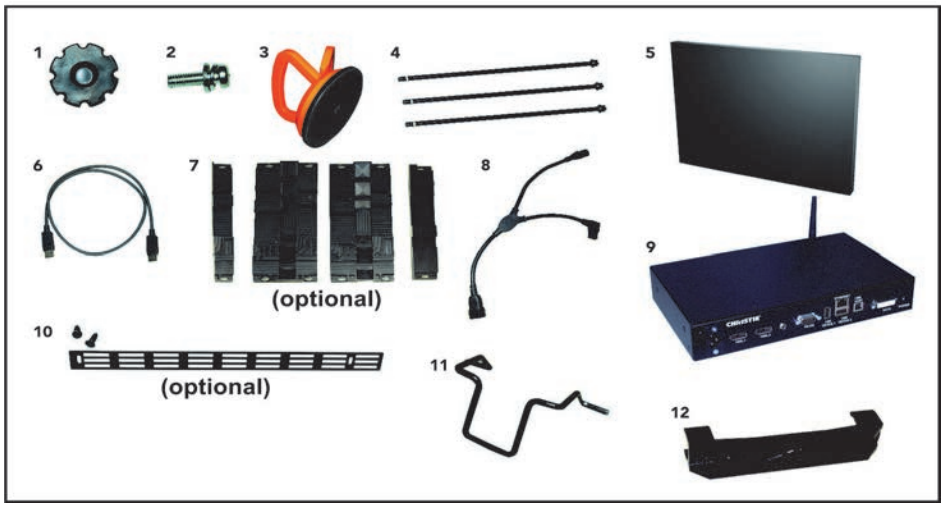
Before an array is constructed, it is important to plan the design layout of the canvas to make sure that ECU placement and the cabling layout supports the overall canvas design objectives. MicroTiles offers considerable flexibility in terms of the number of media sources that can be displayed and the overall resolution. For more information, see the *Christie® MicroTiles™ Specification and Application Guide (P/N:020-100334-xx)*. Color and brightness matching, as well as certain other functions, may be performed across an entire canvas. For details, see *Adjust Image Settings* on page 43.

Required Tools and Hardware

For every MicroTiles system you will need display units, screens (one per display unit), External Control Units (ECUs), a User Kit, a Y-cord Kit and line cords. This combination provides some of the tools and hardware shown in the illustration below. For a complete overview of the available kits, see *Order Guide* on page 5.

NOTICE

Local or national regulations may not allow the use of Y-cords and may require an alternative method of power distribution, such as standard individual line cords for each tile, or power bars. This may include Japan, China, Korea and others. For details, see *Power Distribution* on page 24 and the *Christie MicroTiles Specification and Application Guide* (P/N: 020-100334-xx).



1	Assembly Tool
2	18mm-M6 Socket Head Cap Screw for Horizontal Alignment *(two per tile)*
3	Screen Removal Tool
4	321mm-M8 Vertical Alignment Rods *(three per tile)*
5	Screen
6	Display Port Cable *(One per tile - a one meter cable is supplied with the tile and a three meter cable comes with the ECU)*
7	End and Center Leveling Feet *(optional)*
8	Y-Power Cord
9	ECU

10	Grille with Hardware *(optional - used in conjunction with End and Center Leveling Feet)*
11	Security Clip for Power Cord Connection to Tile
12	Retention Clip for Y-Power Cord Connections

Not Shown:

- Display Unit *(tile without screen)*
- Straight edge *(not provided)*
- 5mm hex key *(not provided)*
- Light seal trim
- Line cords for Display Units
- Line cords for ECU

MicroTiles Installation

Light Seal Trim Application

The light seal trim is supplied with the Display Unit kit (P/N: 123-001102-xx) and is used to prevent light leakage between the tiles in the array. It is typically used for applications where there is lighting in the space behind the tiles. If required, apply the light seal trim around the back of the outside perimeter of the tile before adding it to the array.

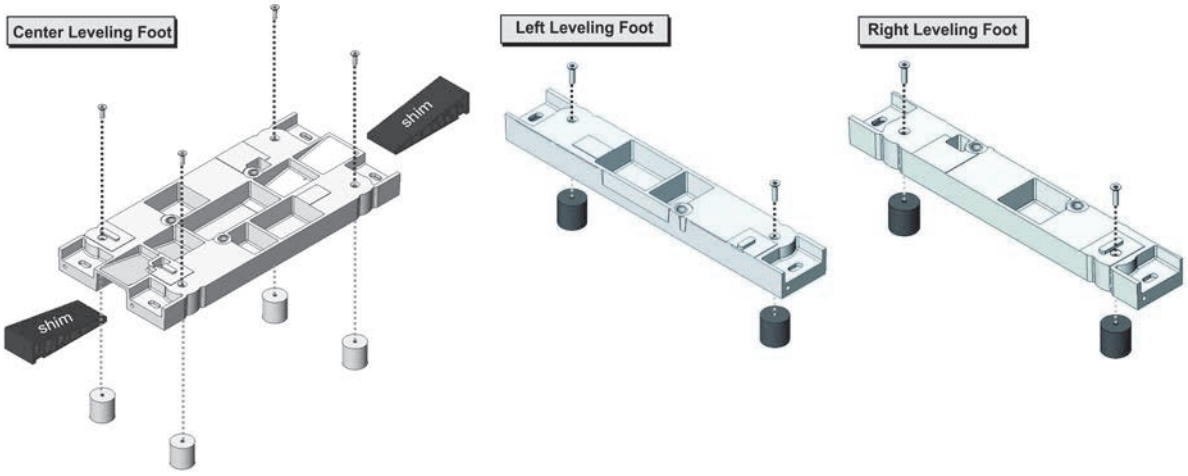
Mount to Leveling Feet (Optional)

DANGER If the array is mounted to the leveling feet it is mandatory they are fastened to an adequately ballasted base structure anytime the array is two rows or higher to prevent tipping and provide stability.

NOTICE Ensure the surface underneath the array is flat before installing the leveling feet.

The leveling feet are used when constructing an array two rows or higher to bolt the array down to prevent tipping, and to level and tilt small arrays. The leveling feet come equipped with machined

points for bolting the array down; however, fastening hardware is not supplied. Use either M6 or 1/4" hardware. Follow all local safety standard and regulations when bolting the array.



Assemble First Row

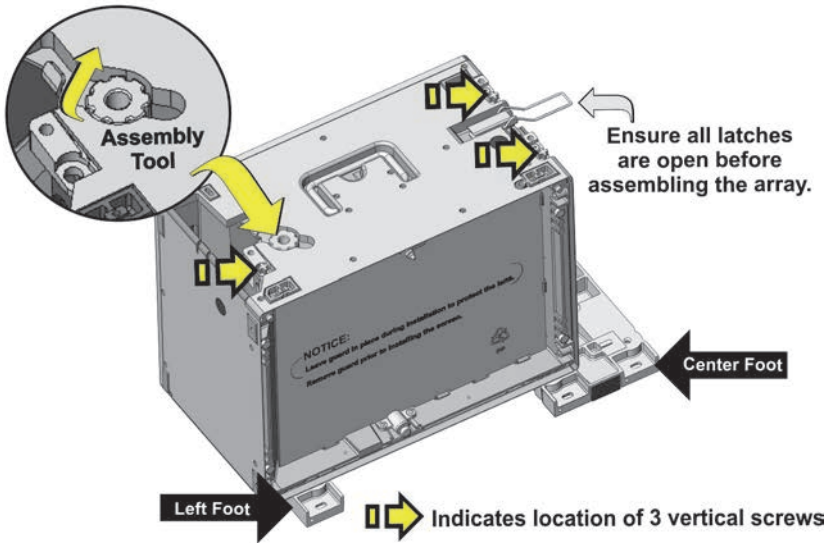
- When installing an array without leveling feet ensure the surface is flat. Do not install vertical screws in the bottom row of installations without leveling feet.
- It is advised that when an array is set up near a wall to connect the cables row by row. When setting up an array where the back is exposed, first setup the entire array and then connect the wires. For details, see *Cable Routing* on page 21.

1. Open the latch on the top of the first MicroTile.
2. Assemble the first tile in the array to a left and center leveling foot.
3. Insert the three vertical screws that are shipped with the MicroTiles into the three positions indicated in the image below.
4. Detach the assembly tool from the top of the tiles and hand-tighten the three vertical screws to mount the tile to the feet. DO NOT completely tighten the screws at this point to allow for adjustments.

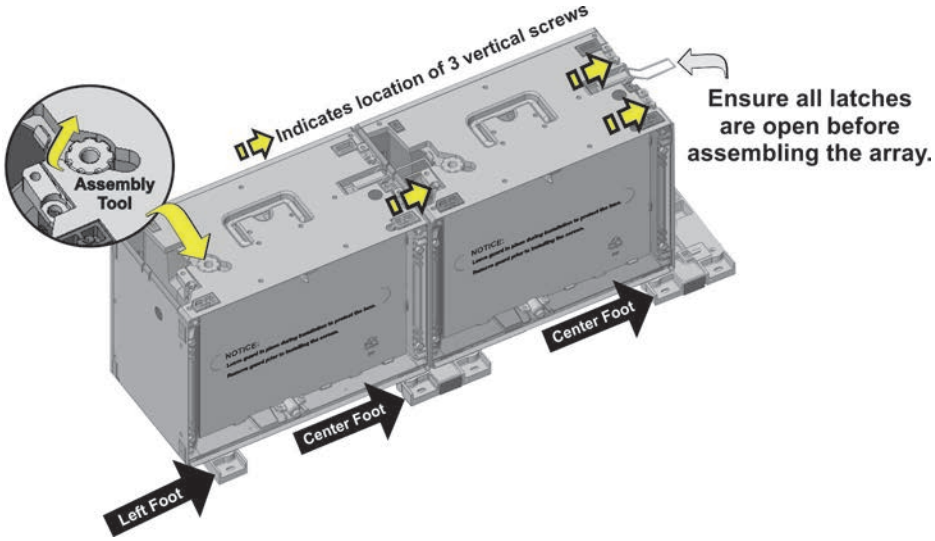
- Do not use power tools to tighten the vertical screws.
- Do not use the vertical screws as anchors to hang the array

Install a screen onto the tile. For details, see *Unpack Screens* on page 19 and *Install Screens* on page 20. Use the screens to visually check the horizontal and vertical alignment between each tile. If

needed, use the vertical and horizontal screws to make adjustments. Temporarily remove the screen in order to allow another tile to be added to the row.

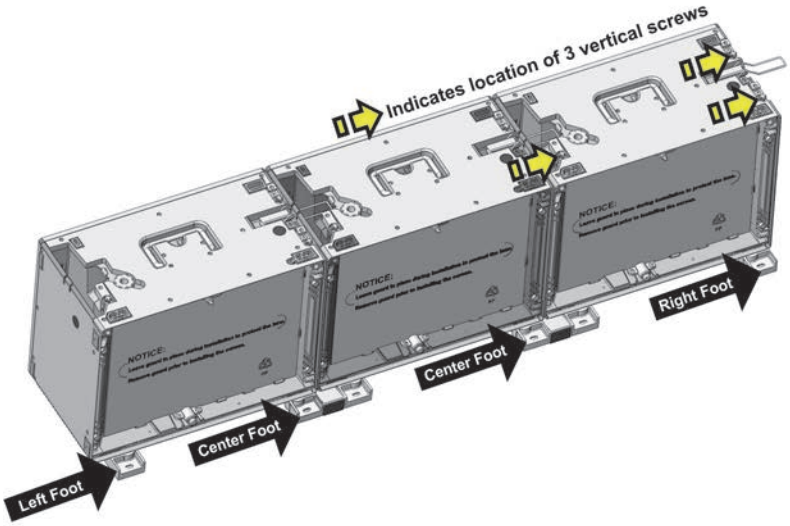

Assembly Tool
Ensure all latches are open before assembling the array.
Center Foot
Left Foot
Indicates location of 3 vertical screws

5. Assemble the next tile in the array to a center leveling foot only. Using the assembly tool, hand-tighten the two vertical screws to attach the tile to the center foot. Do not completely tighten the screws to allow for adjustments.
6. Place the second tile inline with the previous tile.
7. Using the assembly tool, hand tighten the vertical screw on the second tile to attach it to the center foot of the previous tile.



8. Install a screen onto both tiles. For details, see *Unpack Screens* on page 19 and *Install Screens* on page 20. Use the screens to visually check the horizontal and vertical alignment between each tile. If needed, use the vertical and horizontal screws to make adjustments. Temporarily remove the screen from the last tile in order to allow another tile to be added to the row.
9. Repeat steps 6-9 for all remaining tiles that are to be used in the first row.

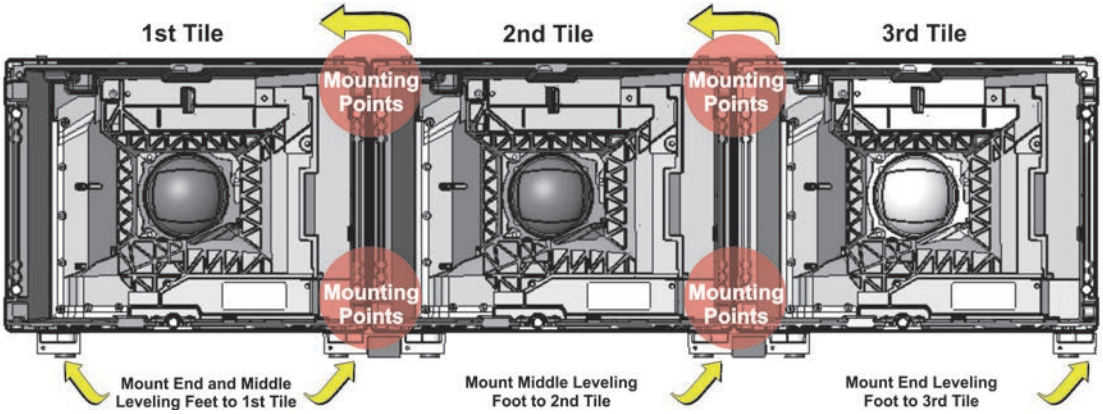
10. Assembly only a right leveling foot to the last tile in the row and secure it to the previous tile.



11. **(Optional)** Hand thread a horizontal adjustment screw into the mounting points between the first two tiles. To allow for adjustments, do not completely tighten until the entire row is complete.

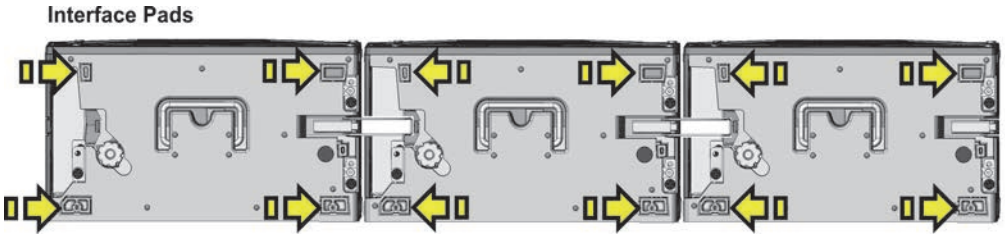
It is recommended that horizontal adjustment screws be installed on additional rows when assembling an array higher than three rows to ensure fine optimization of seams. For arrays that are three rows or less it is not necessary to install the horizontal adjustment screws.

12. Repeat step 12 for every tile added to the first row.



13. Once the first row is assembled, place a straight edge onto the interface pads, along the top of each tile to ensure the row is flat. If needed, adjust the vertical screws (if mounted to leveling feet) and the horizontal adjustment screws.

Poor alignment of the first row limits the size of the array that can be built.



14. Lock the latch from one MicroTile onto the adjacent MircoTile. Repeat for every tile in the row.
15. If the array is mounted to leveling feet, use the assembly tool to completely tighten all vertical screws.
16. Use a 5mm hex key to completely tighten all horizontal adjustment screws.
17. For instructions on how to add additional rows, see *Assemble Second Row* on page 17.
18. If the array is mounted to the leveling feet, insert shims into either the front or the back (or both) of each leveling foot to tilt the array or provide additional security. If necessary, fasten the leveling feet to the base structure.
19. **(Optional)** Fasten the grilles to the leveling feet. See *Required Tools and Hardware* on page 12.

Assemble Second Row

DANGER If the array is mounted to the leveling feet, they must be fastened to an adequately ballasted base structure anytime the array is two rows or higher to prevent tipping and provide stability. The leveling feet come equipped with machined points for bolting the array down to a base; however, the hardware is not supplied. Use M6 or 1/4" hardware and follow all local safety standards and regulations when bolting the array.

1. Open the latch on top of the MicroTile.
2. Place the MicroTile on top of the first tile in the bottom row. Never build from the center out.
3. Push the tile back until the front edge aligns with the front edge of the tile below it.
4. Tighten the three vertical alignment rods with the assembly tool. Do not completely tighten at this point to allow for adjustments.
5. Continue to add the remaining tiles to the second row and repeat step 4 for every tile added to the second row.
6. Once the second row is in place, use the assembly tool to completely tighten the vertical screws. Failure to properly tighten the vertical screws and horizontal adjustment screws causes the tiles to be misaligned.

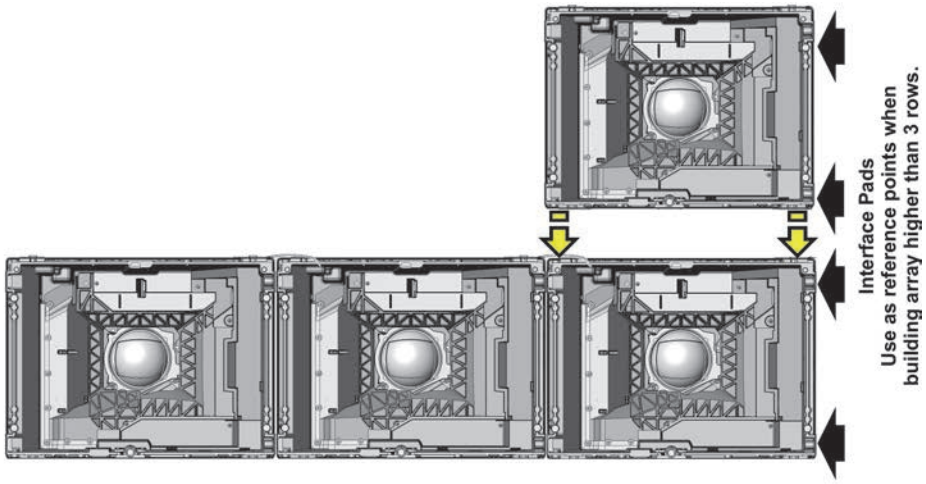
NOTICE To avoid damaging the vertical screws do not overtighten them. Do not use power tools to install the vertical screws.

7. It is recommended that horizontal adjustment screws be installed on all other rows when assembling an array higher than three rows. For arrays that are three rows or less it is not

necessary; however, if you require fine seam optimization, horizontal adjustment screws are recommended on all rows.

8. Place a straight edge along the four interface pads on the side of the column to ensure the top and bottom tiles are straight. If needed, readjust the top tile or the first row.
9. Lock the latch from one MicroTile onto the adjacent MicroTile.
10. It is recommended that screens are installed during the installation in order to check seam gaps, rather than waiting till the array is completely constructed.

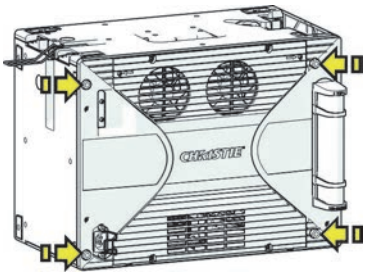
    See steps 5 and 9 in *Assemble First Row* on page 14.



Assemble Additional Rows

⚠DANGER

TIP LOAD! If the array is two rows or higher, additional hardware for tip resistance must be used in order to comply with safety regulations and local codes. Either use the rear mounting points or bolt the leveling feet into the base structure in such a way that the weight of each tile is individually supported. To accomplish this, a mounting bracket can be purchased from Christie (P/N: 123-107109-xx). For details, see Christie® MicroTiles™ Specification and Application Guide (P/N: 020-100334-xx).



⚠DANGER

If the array is mounted to the leveling feet, they must be fastened to an adequately ballasted base structure anytime the array is two rows or higher to prevent tipping and provide stability. The leveling feet come equipped with machined points for bolting the array; however, the hardware is not supplied. Use M6 or 1/4” hardware and follow all local safety standards and regulations.

1. Repeat the steps 1-9, outlined in *Assemble Second Row* on page 17 for each additional row added to the array.
2. For details on using the rear mounting points, see the *Specification and Application Guide (P/N: 020-100334-xx)*.

Unpack Screens

NOTICE

- Do not touch inside of the screen.
- Always handle the screen from the sides.
- Remove all jewelry and watches from your hands and wrists before handling.
- Never use gloves that are dirty or have a rough texture as they can leave marks on the screen.
- Never handle the screen without gloves once it has been removed from the plastic bag.
- Avoid placing the screen on a hard surface.
- Never set the screen on its corner or edge as they are fragile and can be easily damaged.

1. Open the box and, without removing it, examine the screen to ensure it has not been damaged during shipping.
2. Place one hand under the screen's frame, between the front two foam corners.
3. Carefully lift the frame and screen until the front two foam corners are clear of the box.
4. Remove the front two foam corners.
5. Carefully lower the frame and screen back into the box.
6. With two hands, grasp the sides of the frame and lift the frame and screen together out of the box.
7. If the work surface is hard (for example, a table top), have another person close the lid of the box and place the screen on the lid. Otherwise, place the screen on the work surface.
8. Remove the remaining two foam corners.
9. Put on clean gloves.
10. Place one hand lightly on the screen and pull open the plastic bag.
11. Grip the bottom of the bag with one hand and the frame with the other and pull the screen out of the bag.
12. If you have lifted the screen and bag up while performing step 11, place the screen back on the work surface or box.

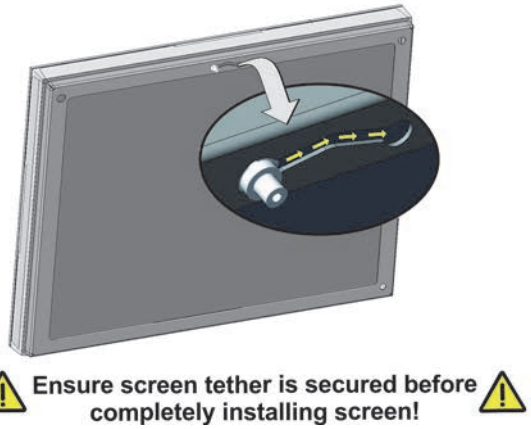
Install Screens

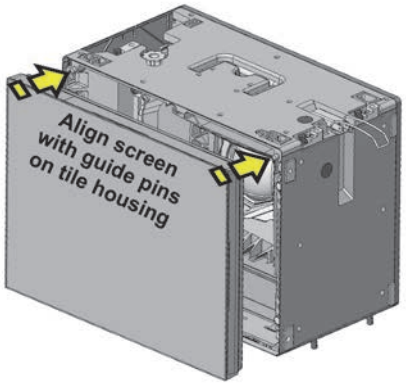
NOTICE

- Do not touch inside of the screen. Always handle from the sides. Remove all jewelry and watches from your hands and wrists before handling.
- Ensure the surface of the screen removal tool is clean and free of debris to avoid damaging the screen.
- In an array, the physical size of the gap between two adjacent screens is affected by temperature and humidity. Improper installation of the tiles also affects both the size and consistency of screen gaps. With proper installation, the average physical screen gap is typically 1.3mm at 25°C (77°F) ambient and 50% non condensing relative humidity, with a variance of ± 0.3mm. Feeler gauges should be used to measure screen gaps accurately.

It is recommended that the screens be installed starting from the bottom of the array.

1. Before installing the screens, remove the lens guard from the tiles and the dust cap from the lens. Replace the lens guard and the dust cap anytime the array is disassembled and shipped.
2. Open the handle on the screen removal tool and gently place it in the center of the screen.
3. Carefully, push the screen removal tool towards the screen using moderate pressure (no more than five lbs / 2.27 kg).
4. Close the handle on the screen removal tool to apply suction.
5. Carefully lift the screen from the work surface.
6. Pull the screen tether out from the top of the tile housing and hook it into the locking latch on the screen. The tether ensures the screen does not fall if subjected to excessive force/vibrations.





7. Line up the two mounting holes on the screen with the two pins on the tile and carefully press onto the tile. Magnets on the housing secure the screen to the tile.

Remove Screens

NOTICE

- Excessive force and/or repeated screen removal may damage the screen.
- Ensure the surface of the screen removal tool is clean and free of debris to avoid damaging the screen.

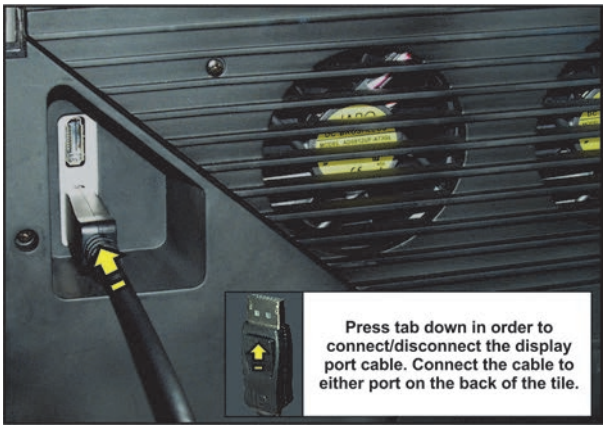
1. Open the handle on the screen removal tool and gently place it in the center of the screen.
2. Carefully, push the screen removal tool towards the screen using moderate pressure (no more than 5 lbs / 2.27 kg).
3. Close the handle on the screen removal tool to apply suction.
4. To remove the screen, carefully pull on the screen removal tool.

Cable Routing

NOTICE

- It is advised to connect the cables row by row when an array is set up near a wall. When setting up an array where the back is exposed, first set up the entire array and then connect the cables.
- Ensure there is sufficient slack in the cable to allow servicing of the tile from the front.
- Do not tie wrap or secure the cabling if the array is set up near a wall.

1. Plug the display port cables into either of the two ports on the back of the tiles. Either port is acceptable on both the ECU and the tile unless connecting multiple ECUs. When using multiple ECUs, HSSL-1 is the local source input and HSSL-2 is the local source output. For details, see *Cabling and ECU Layout and Design* on page 11.
2. Daisy chain the cable from one tile to the next and plug the last one back into the ECU. It is not necessary to make a complete loop; however, communication to the entire array will not be lost if one tile fails.


Press tab down in order to connect/disconnect the display port cable. Connect the cable to either port on the back of the tile.

Cooling

⚠CAUTION

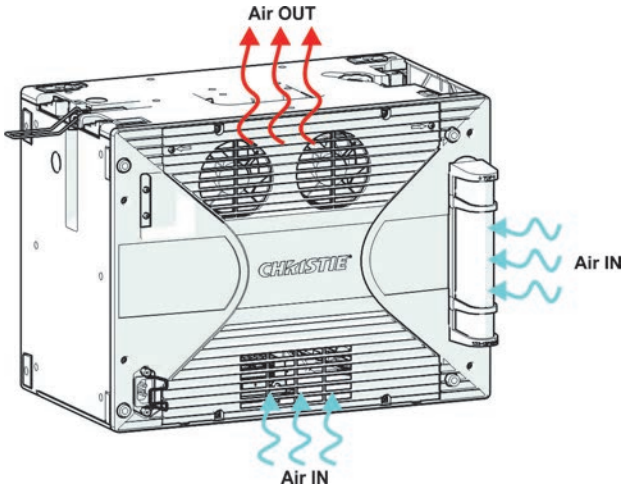
The volume of air directly behind each tile must not exceed the maximum operating temperature of the tile, which is 40°C (104°F). A minimum 2” (50mm) gap must be left at the back of each tile to ensure proper air flow and cooling. Each tile has a maximum cooling load of 110W (375 BTUs/hr) per tile, when operating with brightness and color matching disabled (each LED operating at maximum drive level). For details on airflow requirements, see the Christie® MicroTiles™ Specification and Application Guide (P/N: 020-100334-xx).

NOTICE

99% of the heat generated is exhausted out the back and should be accounted for at the rear of the array. The surrounding air supply MUST be clean and free of excessive dirt, dust and particles in order to ensure proper functionality of the tiles. Failure to ensure a clean air supply may void the warranty.

Tiles are cooled only from the back. If the array is installed in an enclosed area, additional cooling may be required in order to comply with safety regulations and local codes. The inlet air cannot exceed the maximum operating temperature of the tile. For details, see *General Specifications* on page 81.

If proper air flow is not provided the tiles continue to operate for a limited time. If the tiles exceed the preset temperature, they will dim. If it operates at or above that temperature for too long, the tile will power down. For details, see *System Information - Tiles* on page 71.



Connecting Sources

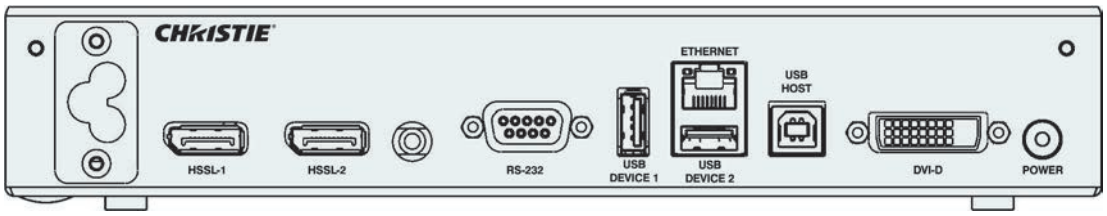
NOTICE

- The WebUI is only functional on the master ECU. It does not communicate with slave ECUs.
- Up to 7m (20 ft.) of long distance communication between the ECU and the tiles is supported at this time.

A MicroTiles array requires an ECU in order to allow the user to display an image using a source, connected via a DVI-D cable. It acts as the controller and ensures the supplied video signal is properly displayed across the entire array.

Once the ECU is connected and powered up, the video content is enabled by default as long as the video source is connected to the DVI-D connection. It also monitors the health of the array.

In a complex setup, multiple ECUs can be utilized. For details on controlling an array with multiple ECUs, see *Power Distribution* on page 24. When multiple ECUs are connected into a single array, an arbitration scheme is used to ensure only one ECU acts as the main system controller (master ECU) and the video source connected to this ECU is always capable of playback on all tiles. Each slave ECU will playback its video source to the connected tiles; it cannot playback the local video from another ECU to its connected tiles.



- **Power Connector:** Each ECU comes with a universal power supply (110V-240V, 50Hz/60Hz) power splitter cable, which forms a T-junction. One end of the 'T' plugs into the back of the ECU and the other two ends form a daisy chain with either another ECU or with a tile.
- **HSSL-1 and HSSL-2:** These bi-directional ports are capable of carrying 5Gbps of video and data in both directions, simultaneously. The ECU is connected via the HSSL interface directly to a tile. The order in which system elements are connected is not significant unless you are connecting multiple ECUs. When connecting multiple ECUs, HSSL-1 is the local source input and HSSL-2 is the local source output.
- **RS-232:** Connect with a laptop or PC for access to all controls and all system status information.
- **USB Device 1/USB Device 2:** Reserved for future use.
- **Ethernet:** A host computer connected to this interface has full access to all controls and all system status information. All firmware can be updated via this port. This interface supports 10-BaseT and 100-BaseT. A web client interface is available through this port and is used as the primary human interface for remote PC based control of a MicroTiles installation. There are two methods of connecting via this port:
  - **Direct Cable:** The PC must be assigned a static IP Address 192.168.0.*x* where 'x' is any integer 2 through 254; at the factory, the IP of the ECU will be 192.168.0.1
  - **Router or Switch:** Press and hold the **Power** button to display the IP Address to which the web browser will be connected.
- **USB Host:** Reserved for future use.
- **DVI-D:** Connect a variety of progressive video and graphics sources to the DVI-D port. The bandwidth of the input is limited to 25 -165 MHz.
- **Power Button:** Press to switch the ECU and any attached MicroTiles array between ON and STANDBY. The bi-colored LED flashes green when the system is in the ON state and red when the system is in STANDBY. If an error occurs the LED flashes red.

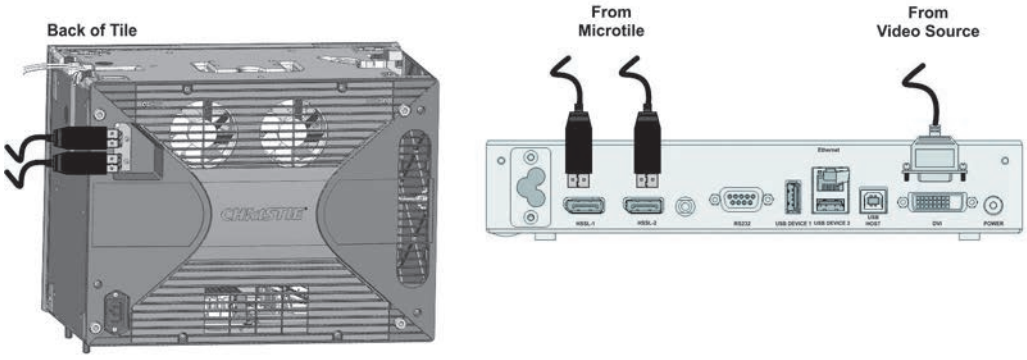
NOTICE

If the power button LED is red and the power connector cord is unplugged, the ECU will remain in a standby state even when the line cord is reconnected.

The Power button can also be used to display the WebUI IP address on the master ECU in multiple ECU configurations or to pair a remote control. Simply press and hold the Power button for five seconds. For details, see *R100 Remote Control* on page 31.

Displaying Content

1. Connect the DVI-D output from the video source (i.e., media player) to the DVI-D input on the ECU.
2. Once the DVI-D is connected and the ECU is powered up, the video is enabled by default. Use the R100 Remote Control to control the video content through the On Screen Display (OSD). For details, see *Remote Control* on page 65.



Power Distribution

For each MicroTiles array Christie provides the necessary line cords required for proper power distribution in your country of origin. For regions that accept Y-power cords, a Y-Cord Kit can be ordered. For details, see *Order Guide* on page 5.

For regions that **do not** accept Y-power cords an alternate solution is required. For details, see the *Specification and Application Guide (P/N: 020-100334-xx)*.

Connect to Power

Always check the firmware version installed on the tile(s) and ECU on initial power up against the version available at www.microtiles.com. Failure to install the latest firmware version can affect system performance. For details, see *Upgrading Main Firmware* on page 60.

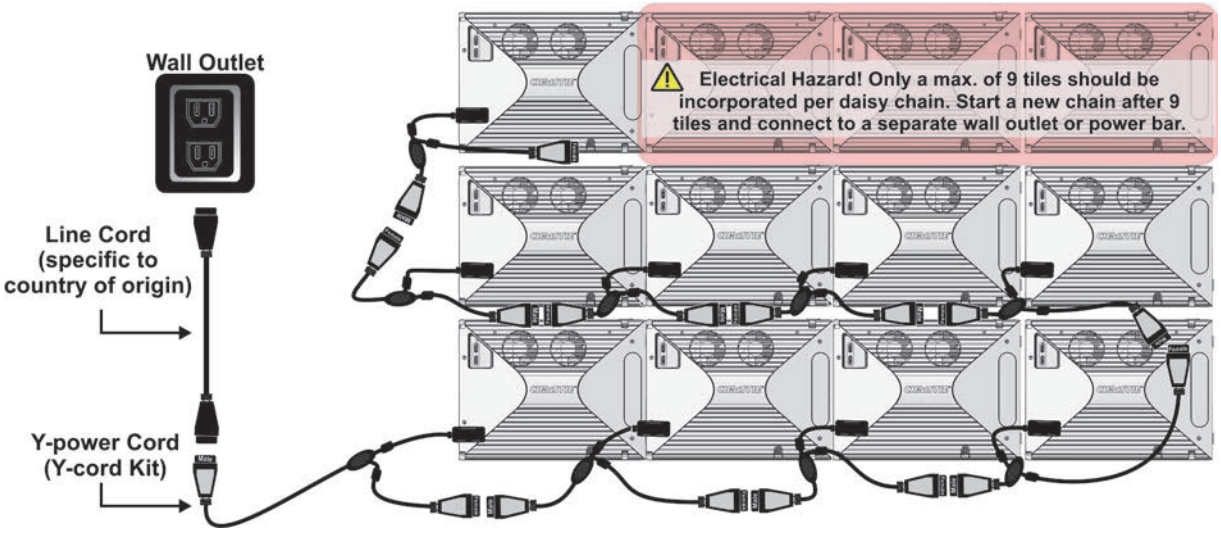
Y-power Cords

⚠WARNING Electrical Hazard! A maximum of nine tiles can be connected per daisy chain. This is the maximum power rating of the Y-power cord. In an array of 12 tiles, two outlets and two power bars should be used.

Local or national regulations **may not allow the use of Y-power cords** and may require an alternative method of power distribution, such as standard individual line cords for each tile, or power bars. This may include Japan, China, Korea and others. The Y-cord Kit (P/N: 123-122106-xx) can be used in the USA, Canada, Mexico, the European Union and Russia.

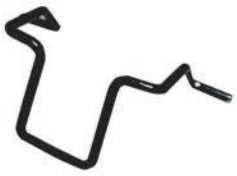
- The Y-cord Kit **does not** include line cords (i.e., the cords that connect the array to the wall outlet). Suitable regional line cords must be used. See *Line Cords for D100 and E100* on page 7.

- A quantity of nine Y-cords are shipped with each kit. Multiple tiles are daisy chained to a single power feed. Up to nine tiles per chain can be supported.

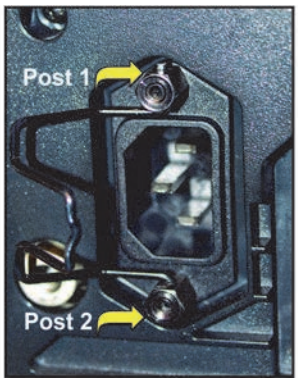

Wall Outlet
Line Cord
(specific to
country of origin)
Y-power Cord
(Y-cord Kit)
Electrical Hazard! Only a max. of 9 tiles should be incorporated per daisy chain. Start a new chain after 9 tiles and connect to a separate wall outlet or power bar.

Install Power Connection Security Clip

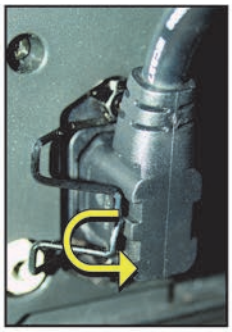
To ensure the power cord is secured to the tile's power connection, a security clip supplied with the Display Unit Kit (P/N: 123-001102-xx) must be installed. To install, insert the end of the clip into the two machined holes on the two posts. If connecting the 90° connection to the tile ensure the clip locks from the left side, if using the standard connector, ensure it locks from the right side.



Power Cord Security Clip



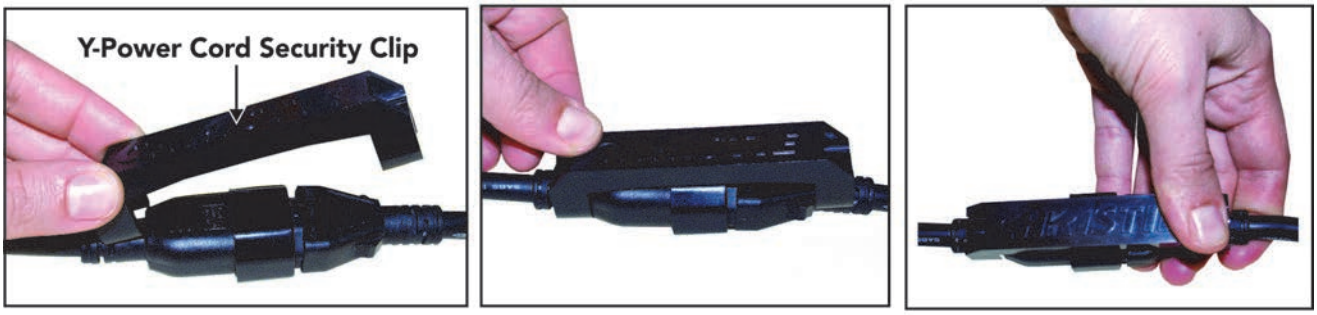
Standard Connector
Ensure clip locks from right-side.



90° Connector
Ensure clip locks from left-side.

Install Y-power Cord Retention Clip

To ensure the Y-power cords are secured between connections a retention clip, supplied with the Y-Cord Kit (P/N: 123-122106-xx), must be installed. To install simply snap the clip onto the two adjoining Y-power cords.



Power ON

1. Connect the power plug from the ECU into an outlet or power bar.
2. Daisy chain the Y-power cords to each tile in the array and connect the standard power plug into an outlet or power bar.
3. Apply electrical tape or tie wraps to secure the inline connection between the Y-power cords.
4. Push the **Power** button ON at the ECU. The LED status light on the button turns green when the system is ready.

NOTICE It is recommended that a power bar with an in-line power switch be used to simplify switching the array ON and OFF. If any of the tiles fail to power up, check each connection.

Power Down

1. Push the **Power** button OFF at the ECU.
2. Move the power bar switch to the OFF position or disconnect the power plug from the outlet.

Disassembling a MicroTiles Array

1. Power down the array and disconnect all power cables and display port cables.
2. Remove the screens. For details, see *Remove Screens* on page 21.
3. Replace the lens guard and dust cap.
4. Loosen the three vertical screws from each tile in the top row using the assembly tool.
5. Unlock all the latches from the top row.

6. Remove each of the tiles from the top row.
7. Repeat steps 2-6 for all remaining rows.
8. If the horizontal adjustment screws were used in building the array, make sure they are removed.
9. If necessary, remove the bottom row of tiles from the leveling feet.

Operation

Powering Up the MicroTiles Array

⚠WARNING Make sure that you are using a power cable, power plug and socket that meet the appropriate rating standards. Connect the power cable to the AC receptacle at the lower-left corner on the rear of the tiles and to a proper AC power source (outlet). The outlet must be near the equipment and easily accessible. Use the power cable provided with the MicroTiles or an appropriately rated power cable that complies with regional standards. For details, see *Line Cords for D100 and E100* on page 7. Do not attempt operation if the AC power source is not within the rated voltage range as specified on the license label (found on the back of the tile).

NOTICE A maximum of nine tiles may be connected per daisy chain. In an array of 12 tiles, two outlets and two power bars should be used.

1. Connect the power plug from the ECU into an outlet or power bar.
2. Daisy chain the Y-power cords into each tile in the array and connect the standard power plug into an outlet or power bar. For more information on how to connect the power cords, see *Power Distribution* on page 24.
3. Apply electrical tape or tie wraps to secure the inline connection between the Y-power cables. The LED status light on the ECU **Power** button is red during the power-up sequence, which takes approximately one minute.

   We recommend that a power bar with an in-line power switch is used to simplify switching the array ON and OFF. If any of the tiles fail to power up, check each connection.

4. Once the array (ECU and tiles) is powered up, the LED status light on the ECU **Power** button flashes green.
5. For information on how to display content onto the MicroTiles array, see *Connecting Sources* on page 22.

If a Display Unit Fails to Power Up

- Check to ensure each cable is properly connected.
- Cycle power to the failed tile(s) or the entire array using the switch on the power bar.
- Check the LED on the back of each tile. A flashing green light indicates power is enabled.

Powering Down the MicroTiles Array

1. Push the **Power** button OFF at the ECU.
2. Move the power bar switch to the OFF position or disconnect the power plug from the outlet.

Status Indicators

The ECU is equipped with a status LED built into the **Power** button.

ECU LED Indicators

LED Mode	Description
OFF	No Power
Green	Slave ECU (**NOTE:** *only one ECU can be the Master ECU*)
Green: Flashing	Master ECU
Red: Solid	ECU in STANDBY mode or booting on power up

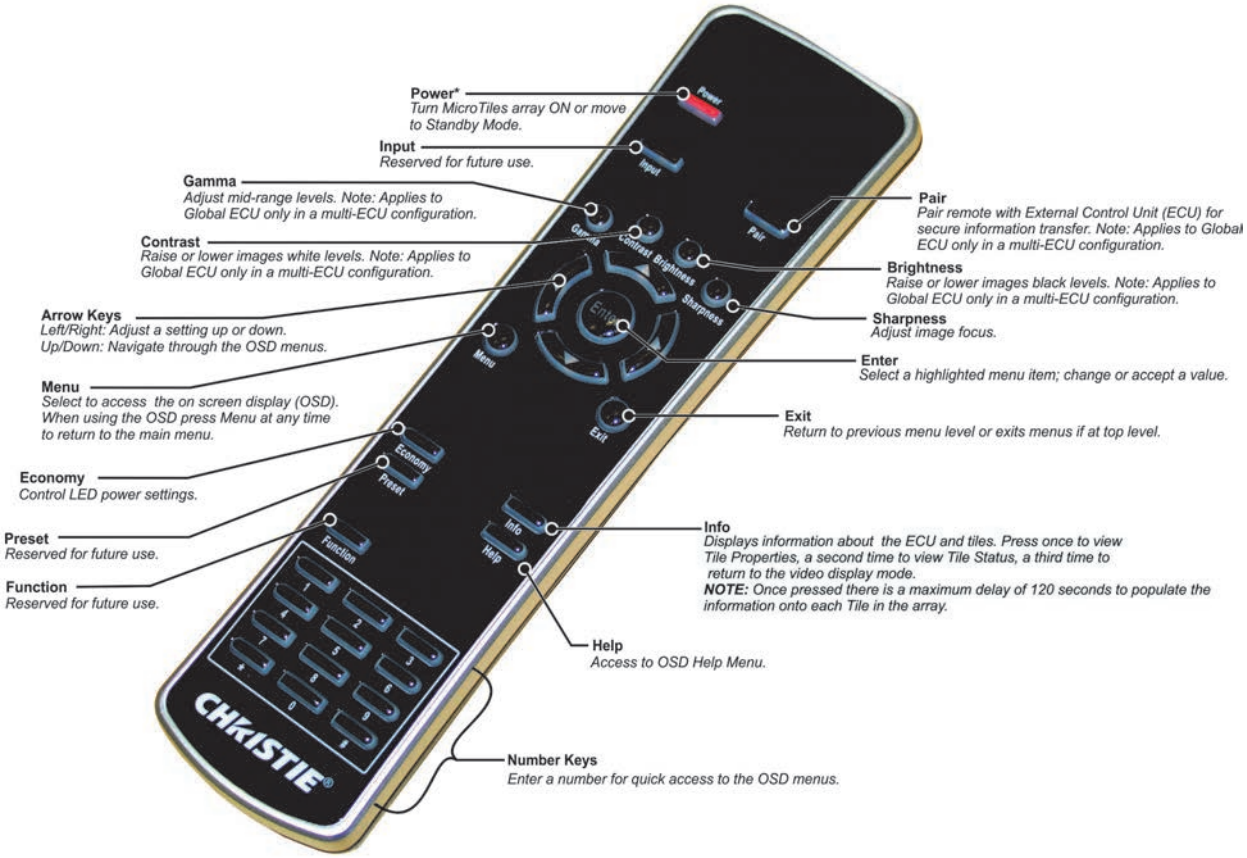
Each tile is equipped with a tri-color LED, located on the back of the tile, which indicates power status.

ECU LED Indicators

LED Mode	Description
OFF	No Power
Amber	Power ON, Hardware is Good, No Firmware
Green	Power ON, Hardware is Good, Firmware is Good
Green: Flashing	Power ON, Hardware is Good, Firmware is Good, Communicating with ECU
Red: Solid	Power ON, No Hardware

R100 Remote Control

This radio frequency remote control is used to navigate the menu commands on the OSD from up to 100m (328ft) away.


Power*
Turn MicroTiles array ON or move to Standby Mode.
Input
Reserved for future use.
Gamma
Adjust mid-range levels. Note: Applies to Global ECU only in a multi-ECU configuration.
Contrast
Raise or lower images white levels. Note: Applies to Global ECU only in a multi-ECU configuration.
Arrow Keys
Left/Right: Adjust a setting up or down.
Up/Down: Navigate through the OSD menus.
Menu
Select to access the on screen display (OSD). When using the OSD press Menu at any time to return to the main menu.
Economy
Control LED power settings.
Preset
Reserved for future use.
Function
Reserved for future use.
Pair
Pair remote with External Control Unit (ECU) for secure information transfer. Note: Applies to Global ECU only in a multi-ECU configuration.
Brightness
Raise or lower images black levels. Note: Applies to Global ECU only in a multi-ECU configuration.
Sharpness
Adjust image focus.
Enter
Select a highlighted menu item; change or accept a value.
Exit
Return to previous menu level or exits menus if at top level.
Info
Displays information about the ECU and tiles. Press once to view Tile Properties, a second time to view Tile Status, a third time to return to the video display mode.
NOTE: Once pressed there is a maximum delay of 120 seconds to populate the information onto each Tile in the array.
Help
Access to OSD Help Menu.
Number Keys
Enter a number for quick access to the OSD menus.

Guide to Keypads

The remote keypad controls the tiles via communication from a battery-powered RF transmitter. Press the arrow keys down once for each continuous adjustment/movement in one direction. If a key is pressed while the tiles are still responding to a previous action, such as during power up, the second key press may not take effect. These are toggle keys, which require you to press once or press twice or use the up/down arrow keys.

NOTICE

- There are no simultaneous key combinations; press keys one-at-a-time.
- Two AAA batteries are required.
- The keypad on the remote remains lit when the batteries are running low.

Keypad Commands

Power

Press the **Power** button on the R100 Remote Control to toggle the array ON. The LED light on the ECU turns green when power is enabled. Press again to place the ECU in STANDBY mode. The LED light on the ECU turns red when the array is in STANDBY mode.

This is not a complete powered down state. To completely disable power turn the array OFF at the power source.

Input

Reserved for future use.

Pair

Press to pair the remote with the ECU for secure information transfer. For more information, see *Pairing the Remote to the ECU via the OSD* on page 33.

Contrast

Changes the level of peak white in the image. Use the **Left/Right Arrow** keys to reach the desired level of contrast. For best results, start low and increase so that whites remain bright, but are not distorted or tinted and to avoid light areas from becoming fully white (i.e., “crushed”). Low contrast causes dim images. Press **Enter** to apply changes.

Brightness

Increases or decreases the black level in the image. Use the **Left/Right Arrow** keys to reach the desired level of brightness. For best results, start high and decrease so that dark areas do not become fully black (i.e.,“crushed”). Overly high brightness changes black to dark gray, causing washed-out images. Press **Enter** to apply changes.

Gamma

Determines how gray shades are displayed between minimum input (black) and maximum input (white) for a given amount of signal. The proper setting helps maintain optimized blacks and whites while ensuring a smooth transition for the “in-between” values utilized in grays. Unlike brightness and contrast controls, the overall tone of an image can be lightened or darkened without changing the two extremes. The images will be more vibrant with good detail in dark areas when using the **Gamma** control. The nominal setting for **Gamma Correction** is 2.22 for most signals and conditions. If excess ambient light washes out the image and it becomes difficult or impossible to see details in dark areas, increase the gamma correction setting to compensate. Once the desired gamma level is established, press **Enter** to apply the changes.

Sharpness

Increases or decreases the sharpness settings of the image. Use the **Left/Right Arrow** keys to reach the desired sharpness level.

Arrow Keys

Use the **Left/Right arrow** keys to change a slide bar value.

Enter

Press to apply any changes made through the OSD to the array.

Menu

Press to access the OSD. Once you are working within the OSD you can press **Menu** at any time to return to the main menu.

Exit

Press to return to the previous level or menu.

Economy

Press for a shortcut to the **Canvas Management > Canvas Settings** menu, which is used to control the LED power settings. For details, see *OSD Canvas Management Menu* on page 37.

Info

Press once to display the tiles' properties on each tile. Press again to display the tiles' firmware version on each tile. Press again to exit to video. Once pressed there is a maximum delay of 30 seconds to populate the information onto each tile in the array.

Preset

Reserved for future use.

Number Keys

Use the number keys for quick access to the OSD menus.

Function

Reserved for future use.

Help

Press to access the **Help** menu.

Pairing the Remote to the ECU via the OSD

The remote must be paired with the master ECU in order for it to communicate with the MicroTiles array.

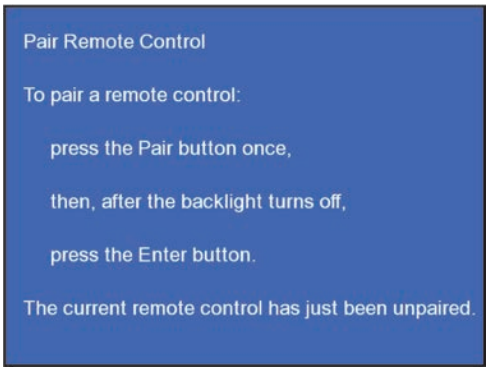
- Pairing does not function with slave ECUs.
- Only one remote can be paired with the master ECU

The following instructions outline how to pair the remote through the OSD. For information on how to pair the remote using the WebUI, see *Remote Pairing via the WebUI* on page 65.

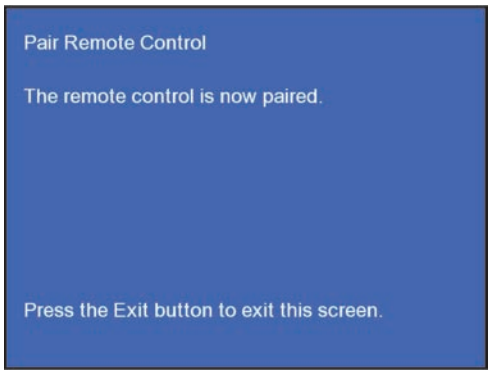
Before attempting to use the OSD via the remote control, you should wait approximately 30 seconds after a video signal appears on the array to ensure enough time has passed for the firmware to start correctly. Otherwise, the OSD menu will appear on the wrong tile(s).

Remote Pairing via the OSD

1. Press and hold the **Power** button on the ECU for approximately five seconds until the screen shown below appears. If the remote is not paired within 30 seconds the application times out, the message `A remote control could not be detected` appears on the display for three seconds and the OSD will return to video.


Pair Remote Control
To pair a remote control:
press the Pair button once,
then, after the backlight turns off,
press the Enter button.
The current remote control has just been unpaired.

2. Press the **Pair** button on the R100 Remote Control and then the **Enter** button. Once pairing is successful, the screen shown below appears on the OSD. If the **Pair** button is accidentally pressed on the remote when the array has been paired, press it again to toggle pairing mode OFF.



Using the On Screen Display (OSD)

OSD Functionality

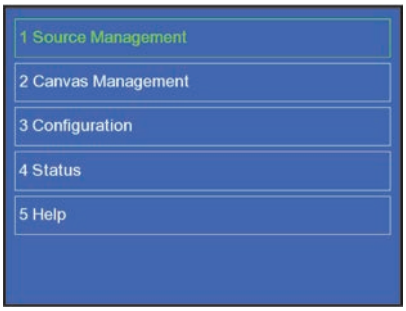
- Adjust display window offsets
- Specify Video or OSD display mode
- Disable and enable automatic array configuration
- View input properties, which includes:
    - DVI clock
    - Input
    - Pixel width
    - Pixel height
    - Frames per second
- Display a test pattern
- Select all tiles in an array
- Calibrate all tiles in an array
- Turn the tiles array ON and OFF
- Reset the ECU
- Set date and time
- View the status of the tiles and ECU (i.e., properties, firmware versions, IP address, etc.)
- Help menu

OSD Guidelines

If the OSD and WebUI are used simultaneously, the OSD menus may not display correctly. If a menu button is pressed, but does not appear on the display after a few seconds, press the **Exit** key several times and re-enter your selection(s).

- There are no simultaneous key combinations; press keys one at a time.
- Pause briefly between key presses to allow the tiles to respond to the previous action.
- Press **Exit** once to cancel a selection or go back one level in the menu.
- If the back light turns OFF, push any key to turn it ON again.

Navigating the OSD Menus



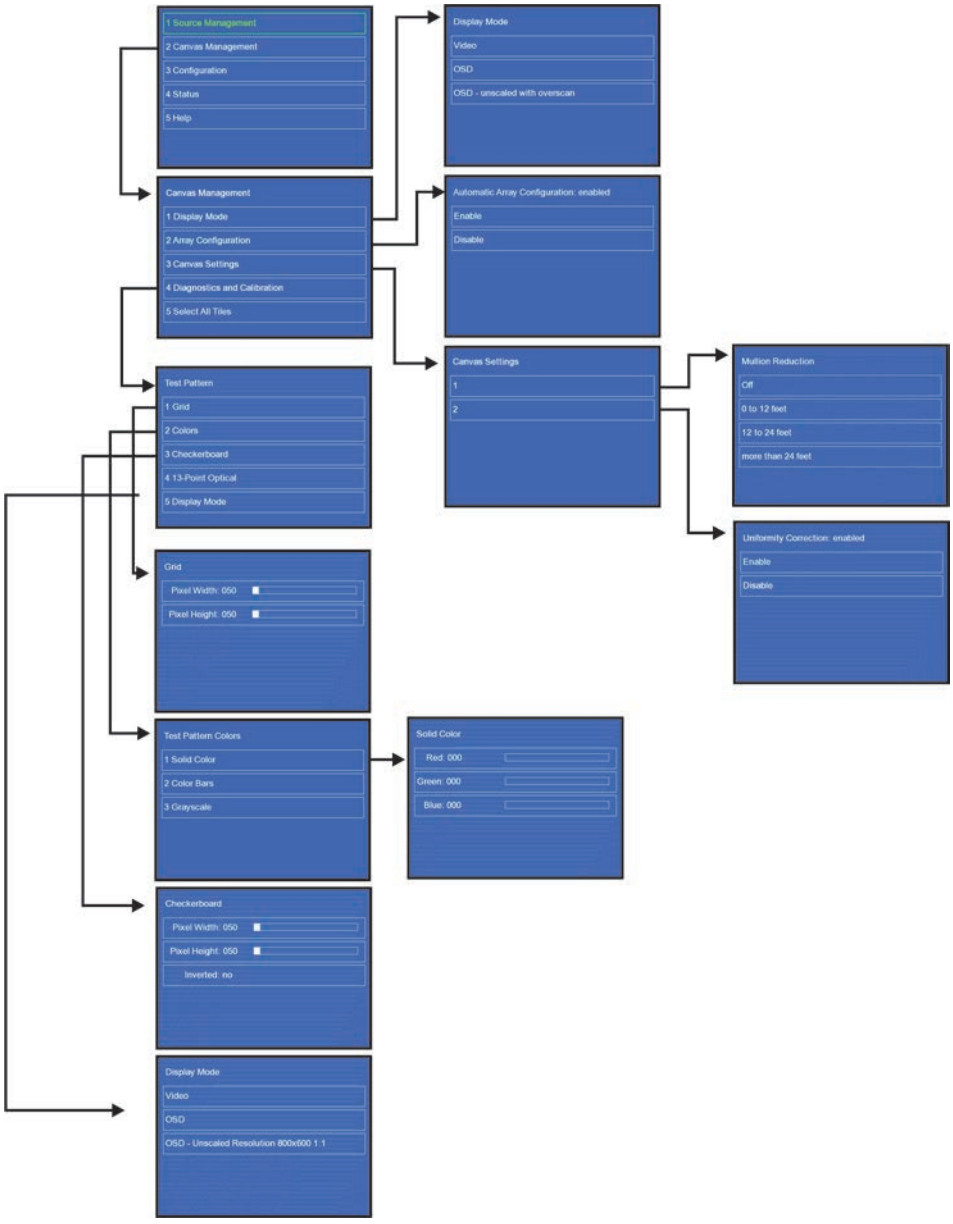
To access the OSD, press **Menu** from the R100 Remote Control. Basic controls of the tiles are accessed from within the OSD menu system. When the OSD is activated, it appears on the top-left tile in a mapped array and anywhere if the array is unmapped. All other tiles in the array remain on video. With the **Main** menu displayed, either use the arrow keys on the remote to highlight the desired option and press **Enter,** or use the number keypad on the remote to make the corresponding selection. The corresponding menu will appear. To scroll through a list of items, use the up/down arrow keys. Press **Exit** once to return to the previous level of options. Press **Menu** at any time to return to the **Main** menu. For a detailed overview, see *OSD Menu Tree* on page 85.

OSD Source Management Menu

This menu allows users to enable and disable the active input source, view and edit the properties of the active input source and display window, and adjust image brightness, color temperature, contrast, gamma and sharpness. Press **Menu** from the remote and use the arrow keys to highlight **Source Management** from the **Main** menu. Press **Enter** to access the menu selections. For quick access to this menu press **Menu** and then **1**. For a detailed description of the same controls accessible from the WebUI, see *WebUI Source Management Menu* on page 43.

OSD Canvas Management Menu

This menu enables users to select the video signal for displaying content onto the tiles. It also allows users to enable/disable array configuration or to adjust display settings; such as intensity, color matching, mullion reduction and uniformity correction. Use the **Canvas Settings** menu to adjust color settings. Use the **Diagnostics and Calibration** menu selection to select from a list of test patterns used for troubleshooting and setup purposes. Press **Menu** from the remote and use the arrow keys to highlight **Canvas Management** from the **Main** menu. Press **Enter** to access the selections. For quick access to this menu, press **Menu** and then **2** from the remote. For a detailed description of the same controls accessible from the WebUI, see *WebUI Canvas Management Menu* on page 46.

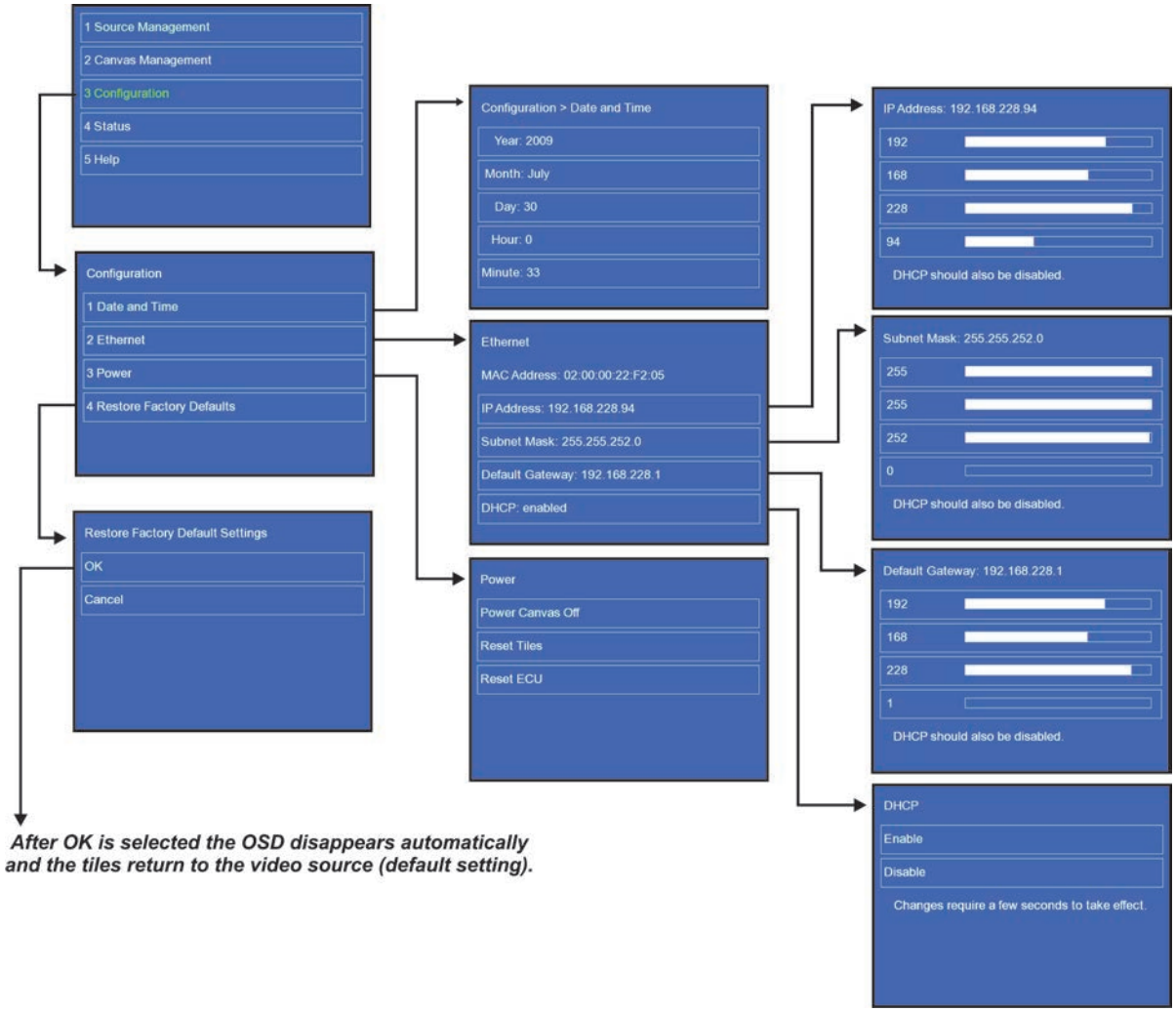


OSD Configuration Menu

The **Configuration** menu allows users to control power and reset the ECU and tiles. Typically, the ECU and tiles need to be reset after a firmware upgrade.

Slave ECUs cannot be reset, powered ON or OFF from the firmware or the remote.

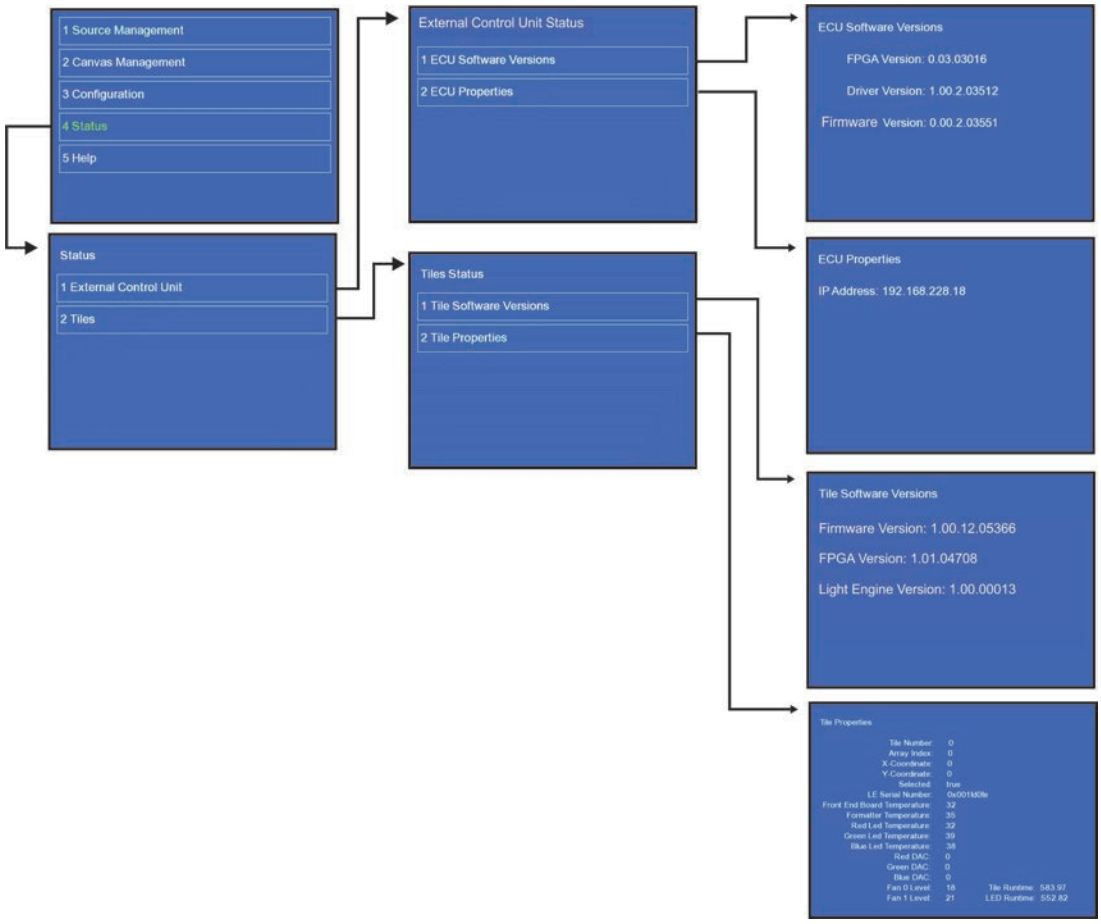
Use the **Left/Right** arrow keys on the remote to adjust the date/time fields via this menu. For a detailed description of the same controls accessible from the WebUI, see *Configuration Menu* on page 59.



If the ECU was disconnected, the message: Waiting for system master. Going to standby in five minutes, appears on the OSD. To avoid going into STANDBY mode re-connect the ECU.

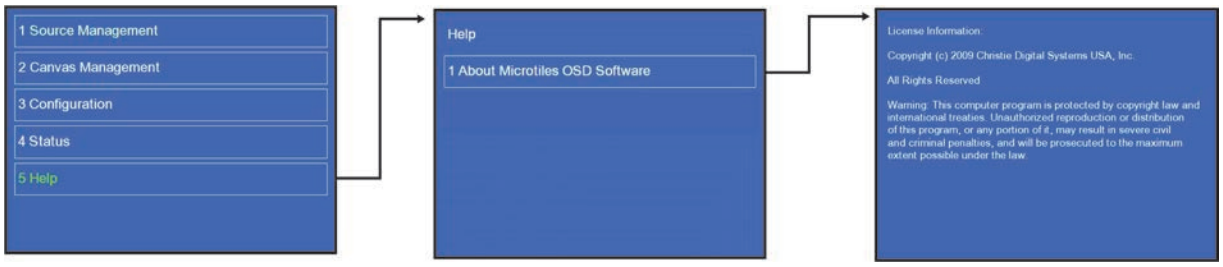
OSD Status Menu

This menu allows users to view the properties and firmware versions of the ECU and tiles. In all applications, the OSD appears only on one tile in an array of multiple tiles; however, when **Tile Properties** and **Tile Firmware Versions** are selected from the **Status** menu, the information is displayed on each of the tiles. For a description of the same controls accessible from the WebUI, see *Status Menu* on page 70.



OSD Help Menu

This menu provides additional support for the OSD menu system. The **About MicroTiles OSD Firmware** selection provides firmware license information. Select **Using Help** to access the online help files.


1 Source Management
2 Canvas Management
3 Configuration
4 Status
5 Help
Help
1 About Microtiles OSD Software
License Information
Copyright (c) 2009 Christie Digital Systems USA, Inc.
All Rights Reserved
Warning: This computer program is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.

Using the Web User Interface (WebUI)

In addition to using the OSD, MicroTiles can also be controlled remotely, typically at a controller such as a PC, via a WebUI on an Ethernet network. If there are concerns about network security, run the WebUI on a local area network only and install a firewall.

Recommended System Requirements

- 1.6 GHz Intel Atom CPU
- 1 GB RAM
- Graphics adapter with 1024 x 768 resolution (must support application window size of 800 x 600)
- Ethernet connection (minimum recommended speed of 1.5 Mbps)

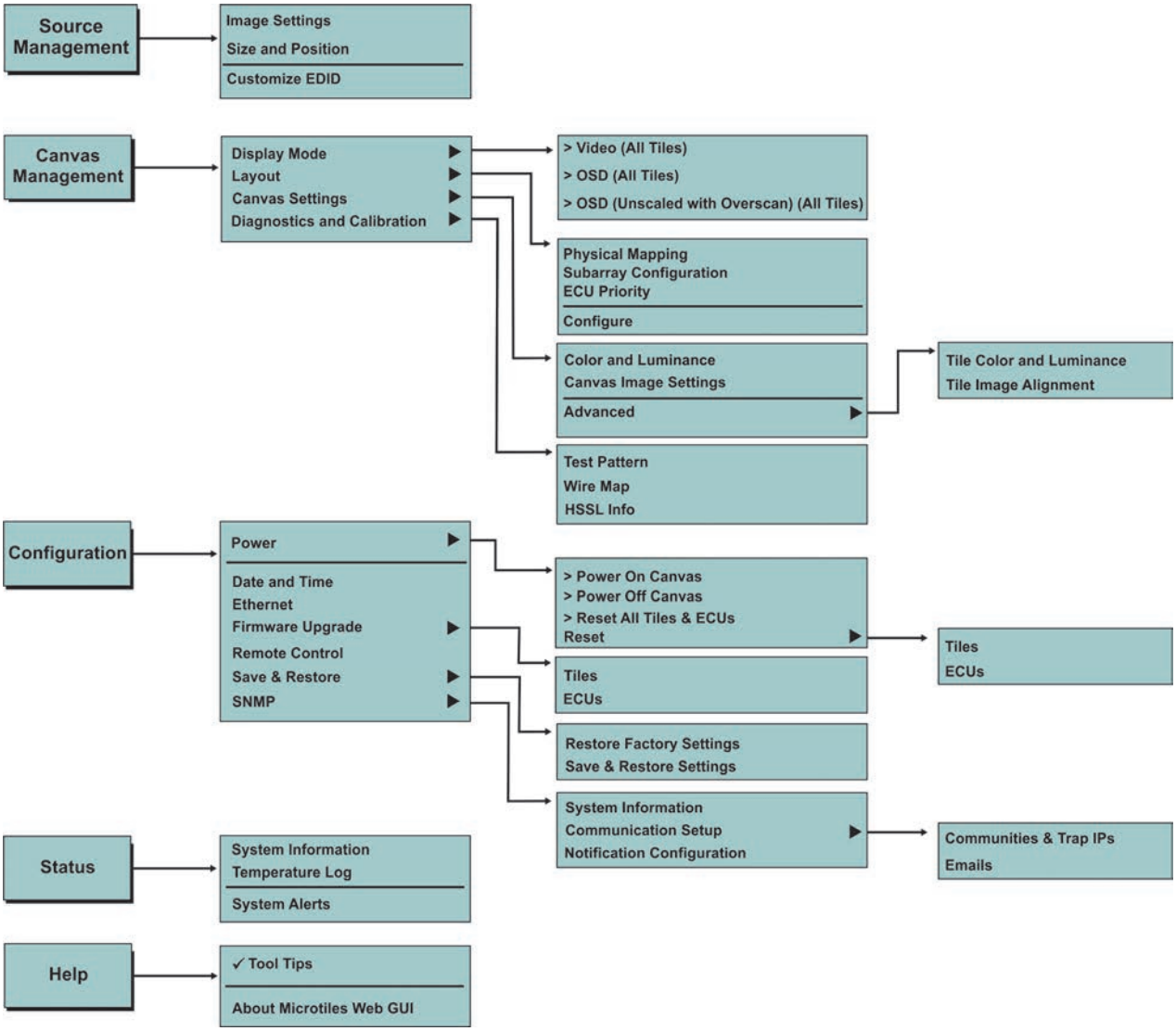
Supported operating system, such as:

- Microsoft Windows® XP or Vista
- MAC OS X Leopard
- Linux

Supported web browser, such as:

- Microsoft® Internet Explorer version 7 or higher
- Apple Safari version 3 or higher
- Mozilla Firefox version 3 or higher
- Adobe™ Flash Player Plug-In 9 or higher

WebUI Menu Tree



Navigating the WebUI

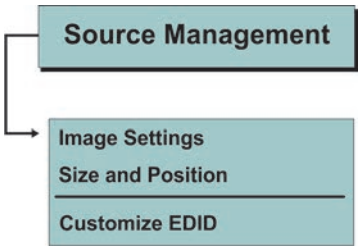
Users are prompted to log in upon start-up. Use **admin** for both the user name and password. Each screen available through the WebUI has the same top toolbar from which the following can be done:

- Select and setup an active input source
- Manipulate the appearance of video content (i.e., size, position, color, sharpness)
- Select between video and OSD display modes
- Perform firmware upgrades

- Display a test pattern
- Array configuration
- View system information and alerts
- View current time and date
- Access online help

WebUI Source Management Menu

This menu allows users to manually or automatically select and setup an active input source. This includes setting up the size and position of the display window and adjusting image settings. The only video input source compatible with MicroTiles is DVI-D.



The maximum input resolution supported per ECU is 1920 x 1200 @60Hz.

Adjust Image Settings

To access the Image Settings screen, click **Source Management > Image Settings** from the top menu bar. This screen enables users to manually adjust the image contrast, brightness and gamma of the ECU video input.

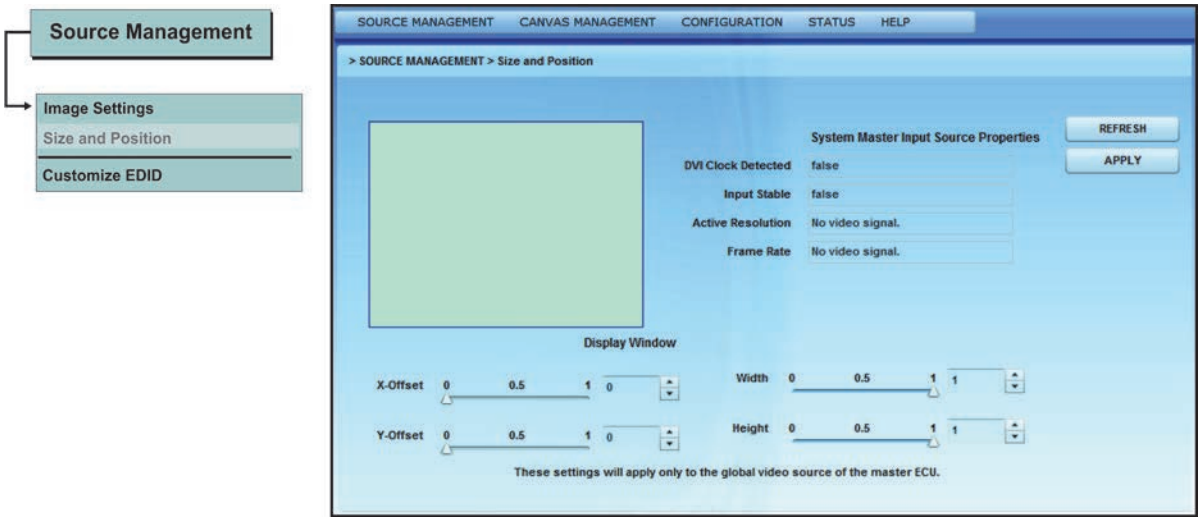
1. Either click **Select All** to select each ECU connected to the array or click on a specific ECU from the spreadsheet. If necessary, click **Refresh** to update the spreadsheet.

   The master ECU has the highest priority number.

2. To manually change the **Brightness**, **Contrast** and **Gamma** settings, use either the scroll bar or the up/down arrow keys to change the value.
3. Click **Apply** to send the changes to the ECU(s) and view the results on the tiles.

Change Size and Position of Video Content

To access the Size and Position screen click **Source Management > Size and Position** from the top menu bar. This screen enables users to manually adjust the X/Y offsets, and the width and height of the display to accommodate the particular application. Automatic array configuration must be enabled in order for this function to work. For details, see *Automatic Array Configuration* on page 51.



System Master Input Source Properties

If necessary, click **Refresh** to scan the properties of the input source detected by the ECU. The input source properties include:

- **DVI Clock Detected** must state **true** in order to view video content on the tiles.When this input reads **false**, check the connection between the ECU(s) and the video source, and try again.

- **Input Stable** indicates the stability of the input source. If this field states **false**, ensure the video source is operating and ensure the video file is not corrupt.
- **Active Resolution** displays the width and height of the array in pixels.
- **Frame Rate** displays the frames per second of the incoming video.

Display Window

NOTICE These settings are only applied to the global video source of the master ECU.

Adjusting the display window settings changes the capture size of the active input window. The **X-Offset**, **Y-Offset**, **Width** and **Height** values are expressed as a percentage of the active input, where the top left of the array represents 0,0. The sum of **X-Offset** and **Width** must be ≥ to 0 and less than 100%. The sum of **Y-Offset** and **Height** must be ≥ to 0 and less than 100%. Once the changes you require have been made, click **Apply** to set the current configuration.

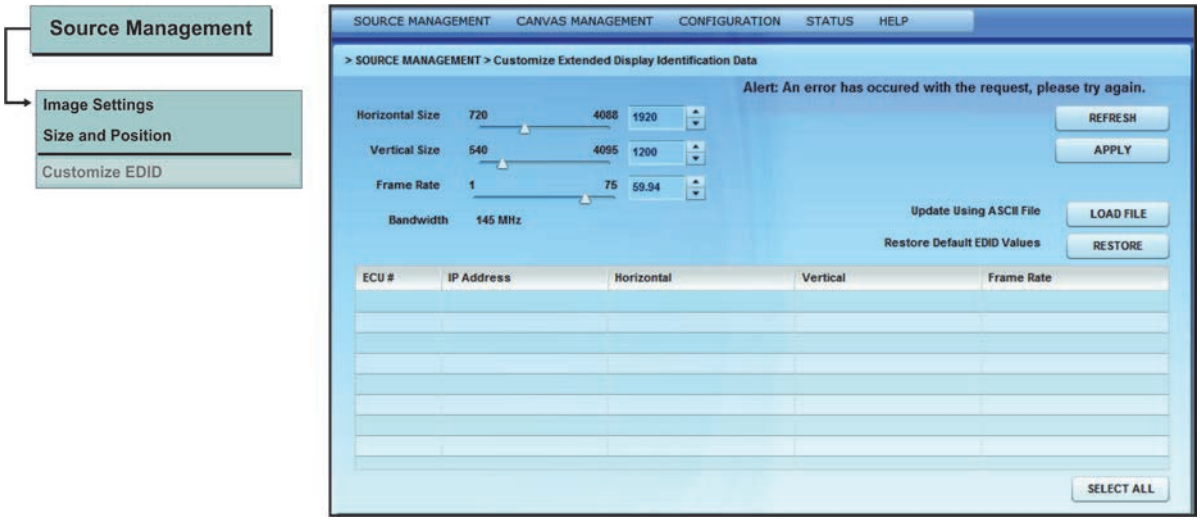
Customize Extended Display Identification Data (EDID)

To access the editor from the WebUI click **Source Management > Customize EDID** from the top menu bar. Customize EDID allows you to create a custom video resolution to send to the graphics card. The default settings are 1920 horizontal pixels x 1200 vertical lines at a vertical frame rate of 59.94 Hz. If you want to restore the default values, click **Restore**. This feature can be used for one or more ECUs. You can select one and adjust the settings or click **Select All** to change the settings for more than one ECU.

1. Click **Load File** beside the **Update Using ASCII File** field if using an ASCII file provided by Christie.
2. Click **Restore** beside the **Restore Default EDID Values** if the ECU cannot detect or display a good video source. This can occur when connecting different types of input sources to the ECU, which can cause the EDID information to be incorrect.

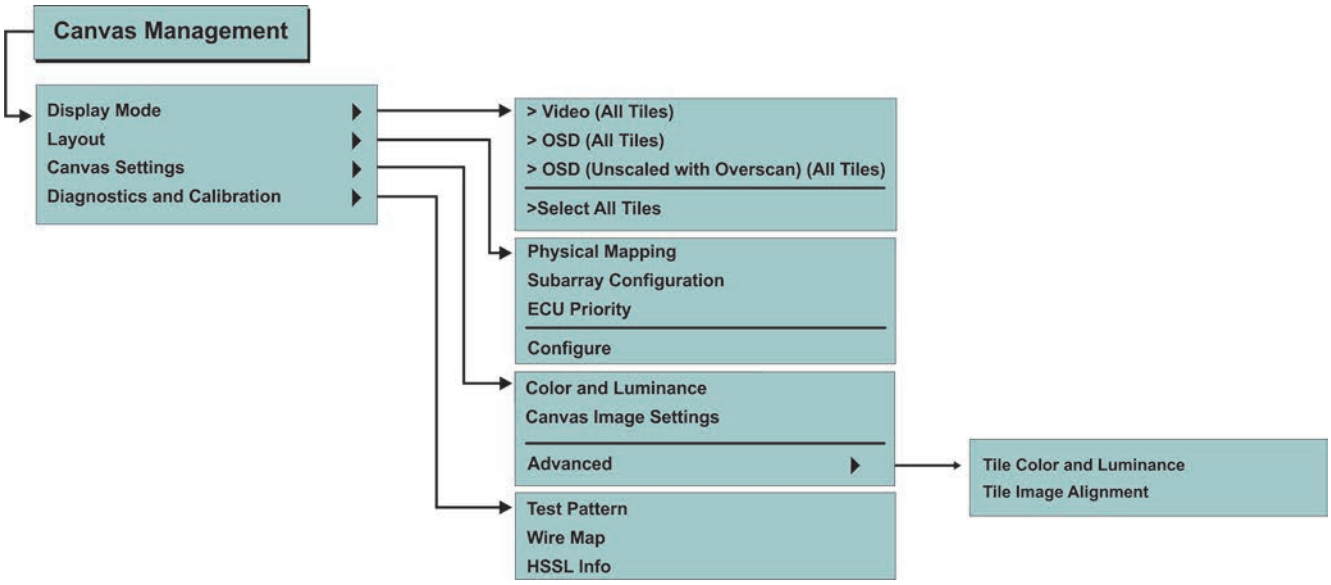
The EDID editor consists of three customizable elements:

- **Horizontal Size:** Use the scroll bar or the up/down arrow keys to adjust the horizontal size of the display. The minimum value is 720 and the maximum value is 4088. The default is 1920. The minimum increment is .001.
- **Vertical Size:** Use the scroll bar or the up/down arrow keys to adjust the vertical size of the display. The minimum value is 540 and the maximum value is 4095. The default is 1200.The minimum increment is .001.
- **Frame Rate:** Use the scroll bar or the up/down arrow keys to adjust the frame rate of the display. The minimum value is one and the maximum value is 75. The default is 59.94. The minimum increment is .001.



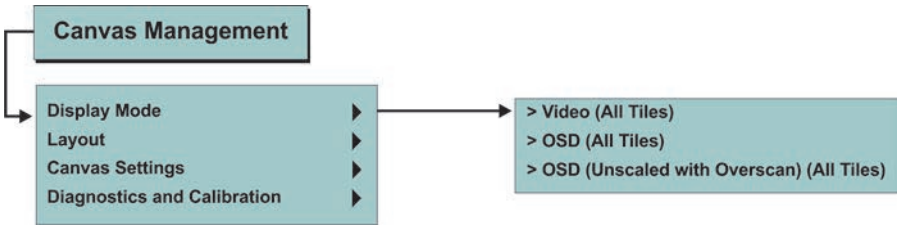
WebUI Canvas Management Menu

Through the Canvas Management menu, the tiles can be automatically or manually mapped, the subarray can be configured, array settings can be adjusted and a test pattern can be displayed. Users can also switch the display between **Video**, **OSD** and **OSD (Unscaled with Overscan)** modes. For most applications **Video** is used.



Select a Display Mode

On the **Canvas Management** menu, click **Display Mode**. Select from **Video (All Tiles)**, **OSD (All Tiles)** and **OSD (Unscaled with Overscan) (All Tiles)** to display the content on the tiles.



Display Mode Options

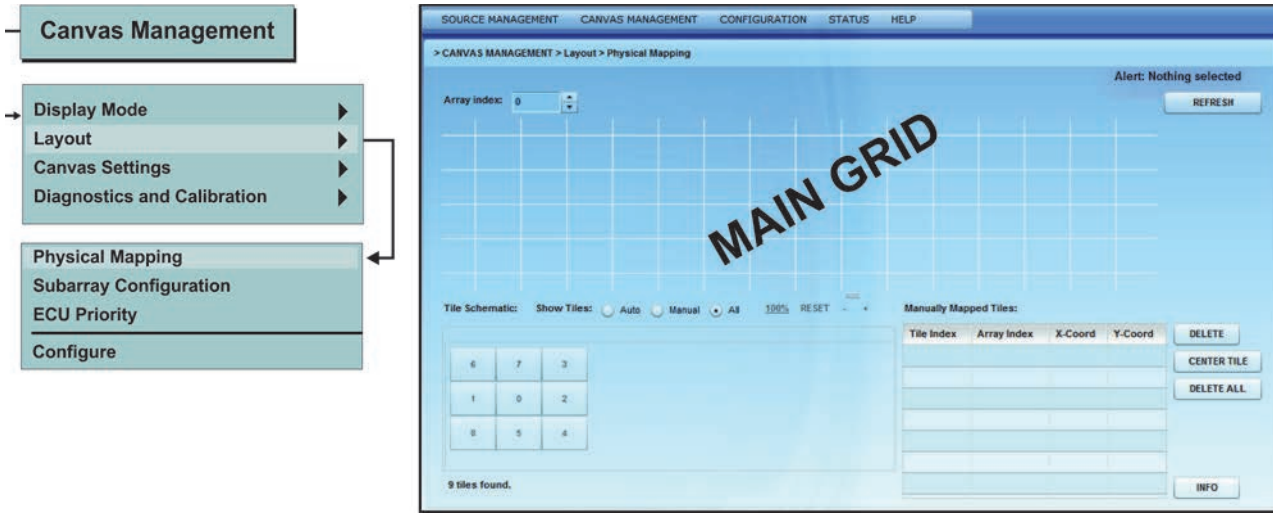
- **Video (All Tiles):** Select to display video from the ECU input source (HSSL-1 or HSSL-2). One or both ports must be enabled. For details, see *Connecting Sources* on page 22.
- **OSD (All Tiles):** Select to display a 800 x 600 image, scaled to approximately 720 x 540, which is the viewable area of the screen.
- **OSD (Unscaled with Overscan) (All Tiles):** Typically, overscan resolution (800 x 600) is used to display test patterns.

Layout

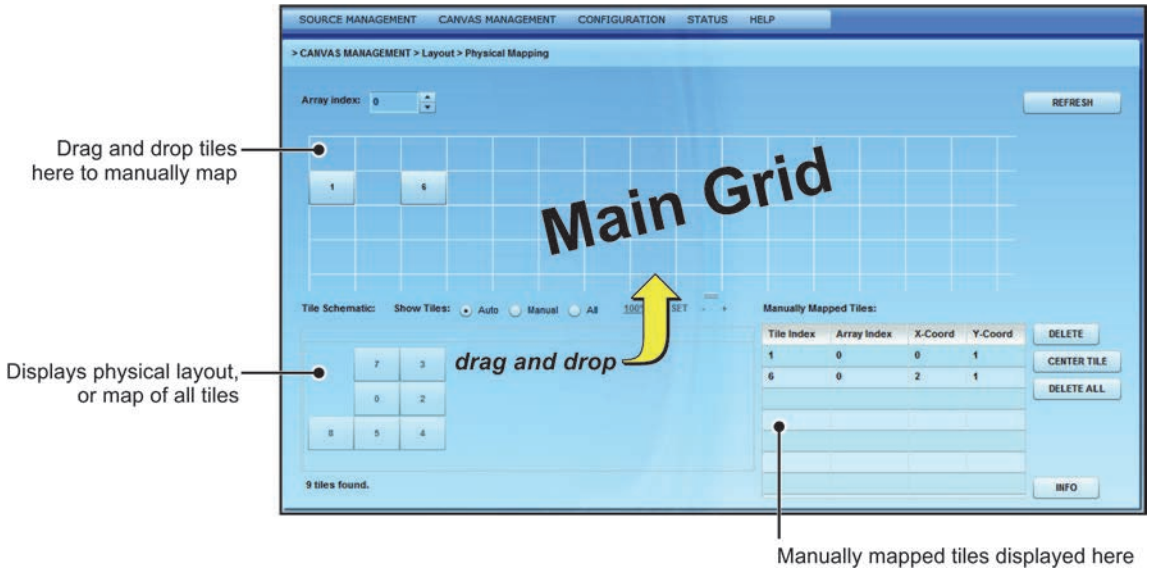
Physical Mapping

Physical mapping is a useful tool when configuring a canvas that includes a group of tiles not physically connected.

1. Ensure **Automatic Array Configuration** is enabled. For information, see *Automatic Array Configuration* on page 51.
2. From the **Canvas Management** menu, select **Layout > Physical Mapping**.



3. Click on a tile in the Tile Schematic section. Drag and drop it into the main grid to manually map it. Use the rows (y-coordinates) and columns (x-coordinates) of the grid to manually map tiles; the input image automatically stretches spanning across all manually mapped tiles. The top left is 0,0. Each array index corresponds to a unique mapping of the input image.
4. The image on the array is automatically configured and mapped once the tile is dropped into the main grid. All blue colored tiles indicate they have been manually mapped and non-mapped tiles are gray. All manually mapped tiles are displayed in the Manually Mapped Tiles table.



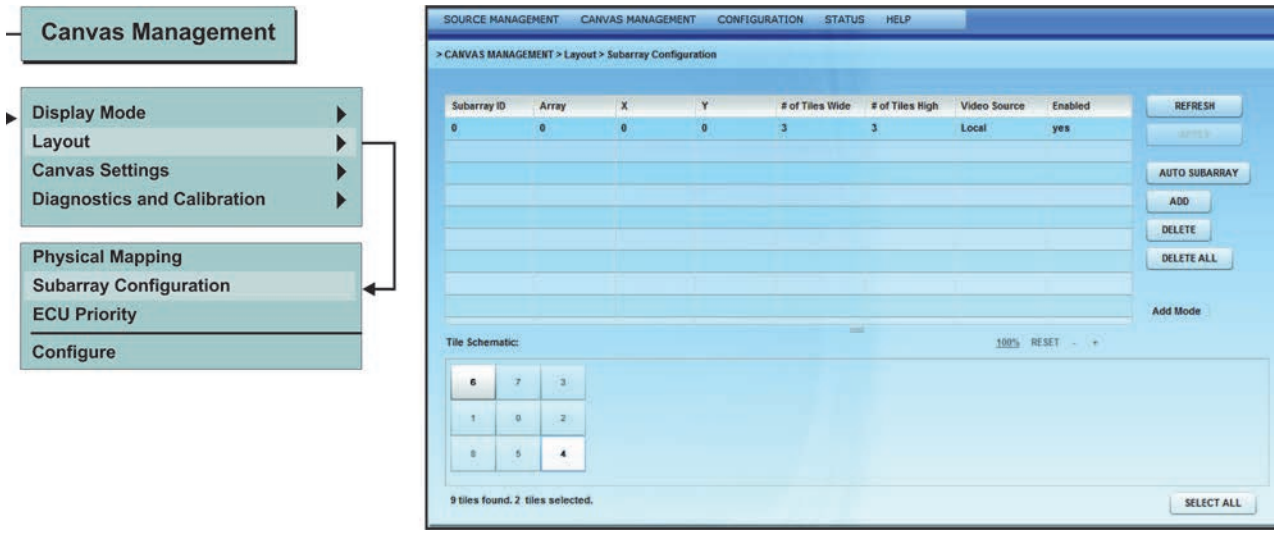
5. Click **Center Tile** to center the main grid on the currently selected manually mapped tile. This is a useful tool when working with a large array. For example, if you wanted to manually map a tile to location x=20 and y=20, select a manual mapping from the table and click **Center Tile** to make the main grid reposition the tile to the center of the main grid.

6. Click the **Info** button to bring up the properties of each tile. This is similar to the **Info** button function on the R100 Remote Control. For details, refer to *R100 Remote Control* on page 31. Use the Tile Properties screen to see the number of each tile. For details, see *System Information - Tiles* on page 71.

Subarray Configuration

Subarray Configuration enables users to display two images on an array or increase the input resolution by combining multiple inputs. In order for this to function multiple ECUs must be connected to the array and automatic array configuration must be enabled. For information on how to connect multiple ECUS, see *Cable Routing* on page 21. To access the Subarray Configuration screen click the **Canvas Management > Layout > Subarray Configuration**.

Subarray configuration is not available via the OSD.

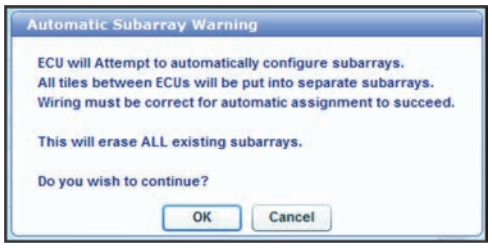


Adding a Subarray Manually

1. If necessary, click **Refresh** to get a reading of any subarray regions that have already been created. This information is then populated in the subarray spreadsheet.
2. Ensure you are in **Add Mode**. You can switch between ADD and EDIT Modes. Edit Mode is grayed out if no subarray is selected in the table. See *Edit a Subarray* on page 50.
3. Click on the top-left tile within the subarray (displayed in Tile Schematic). Hold down the Shift key and click on the bottom-right tile in the subarray. You must select tiles in a diagonal configuration (opposite corners) in order to configure a subarray.
4. Click **Add** once the subarray region has been selected. All the subarrays saved on the master ECU are shown in the spreadsheet.

Adding a Subarray Automatically

1. Click **Auto Subarra**y to put all tiles between ECUS into separate subarrays. In order for this to succeed wiring must be correct. For details, see *Cabling and ECU Layout and Design* on page 11.
2. Once selected you will be prompted with an `Automatic Subarray Warning` message. Click **Ok** to continue.

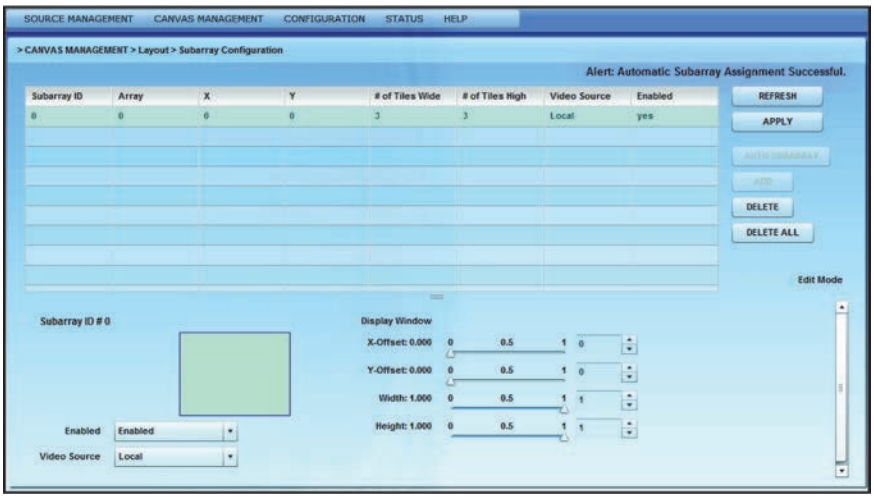

Automatic Subarray Warning
ECU will Attempt to automatically configure subarrays.
All tiles between ECUs will be put into separate subarrays.
Wiring must be correct for automatic assignment to succeed.
This will erase ALL existing subarrays.
Do you wish to continue?
OK
Cancel

Edit a Subarray

1. All the subarrays saved to the master ECU are shown in the spreadsheet.
2. To edit an existing subarray, select it from the spreadsheet and click **Edit Mode**. Once selected, the bottom portion of the window changes to display the editing properties.

Automatic array configuration must be enabled for changes to take affect. For details, see *Automatic Array Configuration* on page 51.

3. Use the scroll bars to adjust the **X/Y Offsets** and to change the width and height of the subarray. The display window will change as you make the adjustments. Click **Set** once you are satisfied with the changes.
4. From the **Enabled** list you can choose to enable or disable the subarray.
5. The **Video Source** for the subarray can be defined from the **Video Source** list. Select **No Video**, **Global** or **Local.** The default setting is **Local**.



ECU Priority

This screen allows users to assign the correct priority to the ECUs, meaning assigning them as a slave or a master. For details, see *External Control Unit (ECU)* on page 4. It is a useful tool to set the master ECU when using multiple ECU configurations. All ECUs are shipped as slaves from the factory.

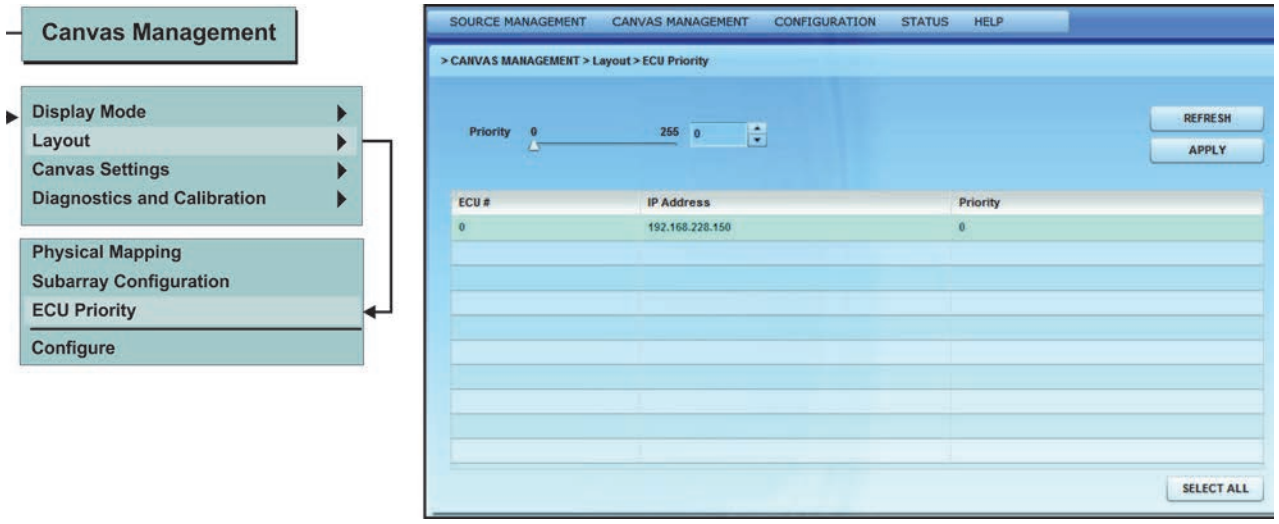
When switching out ECUs in the field it is important to ensure that at least one of them is a master. If you have two masters you must set one of them back to a slave.

1. If necessary, click **Refresh** to load the information from the ECUs connected to the array.
2. Click a row in the spreadsheet to select a single ECU.

   The master ECU has the highest priority number.

3. Once an ECU is selected from the spreadsheet use the Priority scroll bar or the up/down arrow keys to manually set a priority to the ECU. For example, the ECU with the highest number is the designated master and all others are slaves. Once the value is entered click **Apply**.

   Click Select All to select all ECUs and set them to 0 and then select one ECU to set as the master (slaves = 0, master = 1).

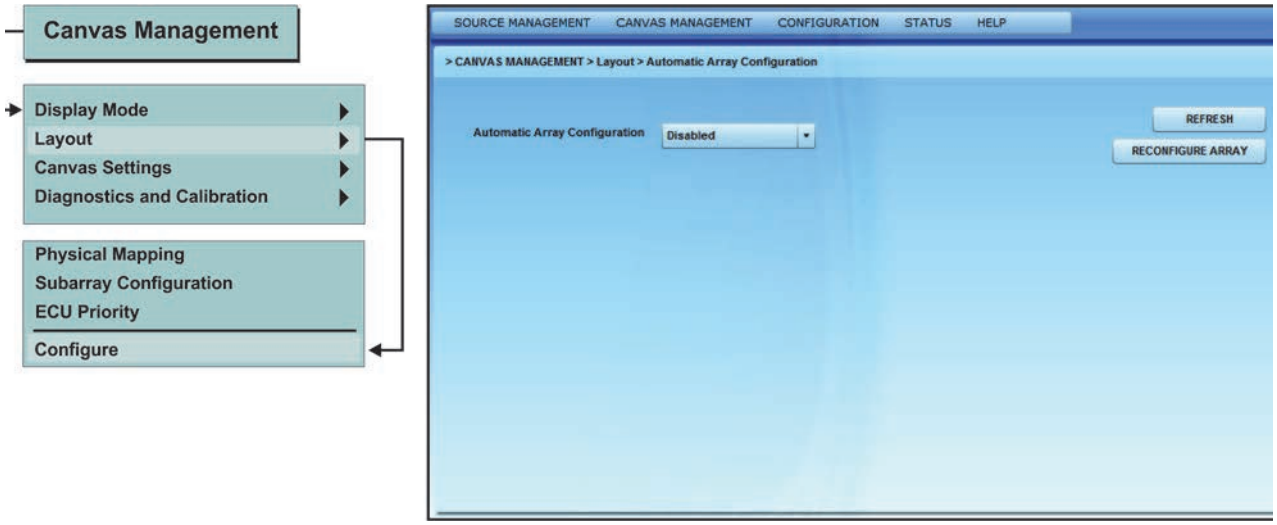


Automatic Array Configuration

MicroTiles are equipped with neighbor detection circuitry. Once power is applied to the array, the ECU uses the neighbor detection circuitry to determine the configuration of the array. It then relays the total dimensions of the array and the exact physical location of the array back to each tile. Array configuration is required to organize the display and to ensure each tile knows its physical arrangement within the array. Configuration is checked approximately every 10 seconds. By default, **Automatic Array Configuration** is enabled. Each tile, knowing its own position within the array and the video source characteristics, is required to crop the active input source, select its own sub-image portion and scale the sub-image to display in full screen.

1. From the **Canvas Management** menu, select **Layout** > **Configure**.
2. Select **Enabled** from the **Automatic Array Configuration** list. With this feature enabled it allows the software to detect changes in the array's setup and configure the array accordingly. For example, it will detect any time a tile is added or removed, tiles are moved, subarrays are changed or manually mapped tiles are changed and configure the array to those settings.

3. If necessary, click **Refresh** to update the array and ensure the most current information is displayed.
4. Click the **Reconfigure Array** to force an array reconfiguration manually.

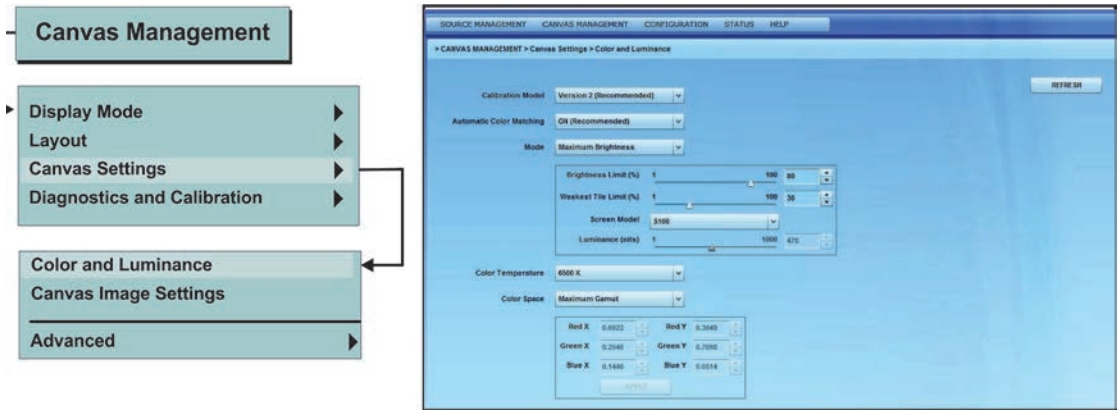


Canvas Settings

Color and Luminance

NOTICE The type of screen must first be specified from the Screen Selection drop-down before adjusting any of the color and luminance features.

The ECU periodically polls all attached tiles to determine the optimal colorimetry and brightness setting for the array as a whole. This optimal operating point is transmitted to all attached tiles. It is the responsibility of the individual tiles to ensure they actually meet the requested colorimetry. The Color and Luminance screen allows users to manually adjust the nits of the entire array and to enable or disable color matching of the array. To access this screen, select **Canvas Management** from the top menu bar and then select **Canvas Settings > Color and Luminance**.



Color and Luminance Options

- **Calibration Model:** This selection allows you to select between the two available color correction models – **Version 1** and **Version 2 (Recommended)**.
- **Automatic Color Matching:** This selection allows you to select the color matching setting. You can choose from **ON (Recommended)** and **Tiles Only**. When **ON (Recommended)** is selected the ECU reads the settings of each tile, calculates the average and applies that reading to each tile in the array. When **Tiles ONLY** is selected color matching is done at the tile level, meaning the tiles will make their best attempt to meet user commanded color/brightness points. In this mode the ECU is not actively maintaining color points across the array.
- **Mode:** The selections of this field change according to the Calibration Model selected. For Version 1 the options include, **Fixed Brightness** and **Off**. For Version 2 the options include, **Economy Brightness**, **Fixed Brightness** and **Maximum Brightness.** In order to change the brightness settings you must specify the intensity mode through the **Mode** field.
- **Luminance Levels:** Use the scroll bar or the up/down arrows to manually set the luminance level, in nits, for the array. When **Mode** is set to **Fixed Brightness** clicking the **Read** button will query the array for the last set value. When **Economy** or **Maximum Brightness** mode is selected clicking **Read** displays the brightness level achieved by the array. The **Set** button is only available when **Mode** is set to **Fixed Brightness**. In **Economy** and **Maximum Brightness** modes the **Set** button is grayed out because the luminance levels are managed by the ECU.
- **Color Temperature:** This selection allows users to manually adjust the color temperature of the array. Color temperature dictates how warm or cool the video output on the array appears. The higher the color temperature, the cooler and bluer the image. The lower the color temperature, the warmer and redder the image. Color temperature settings for **Version 2 (Recommended)** range from 3200-9600K and the settings for **Version 1** range from 5500-8500K. A mode of color correction must be selected from the **Mode** list in order to adjust color temperature.
- **Color Space:** The selections of this field change according to the Calibration Model selected. For Version 1 the selections include sRGB and Custom Gamut. For Version 2 (Recommended) the selections include Maximum Gamut, sRGB and Custom Gamut. This enables the selection of the type of color decoding. The setting defaults to maximum.

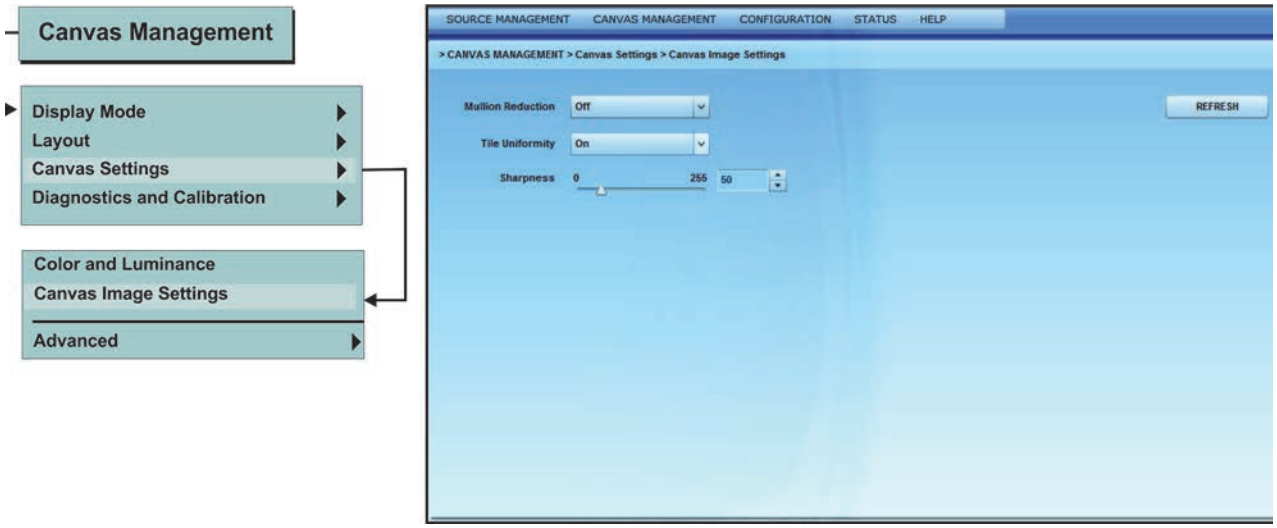
- **Maximum Gamut:** Select this option to apply the maximum available RGB color spectrum. Not an available option when **Tiles ONLY** is selected from **Automatic Color Matching**.
- **sRGB:** Select this option to apply standard RGB color space to the array.
- **Custom Gamut:** Select this option to manually adjust the XY coordinates of the RGB color spectrum.

- **Screen Selection:** From **Screen Selection** select the type of screen being used in the array. Selections include the S100, S200 and S300/S310.

NOTICE This setting must be specified before adjusting any of the color and luminance features to ensure the settings applied to the array are accurate.

Canvas Image Settings

This screen allows users to configure mullion reduction, uniformity correction and sharpness. To access this screen select **Canvas Settings > Canvas Image Settings**.



- **Mullion Reduction:** Use mullion reduction to adjust the brightness level to the edges of the tiles until they appear smaller. It is recommended to have video playing on the array when adjusting mullion to see the changes take effect. Select between **OFF**, **0 to 12 Feet**, **12 to 24 Feet** and **More than 24 Feet**. When a selection is made, you will see the effect on the video content showing on the array. Feet refers to the recommended viewing distance.
- **Tile Uniformity:** Uniformity correction is enabled by default and ensures the light source in the center of the tile (known as the hot spot) is dimmed to ensure brightness is uniform.
- **Sharpness:** Use the **Sharpness** scroll bar or the up/down arrows to adjust sharpness levels.

Advanced Canvas Settings

Advanced: Tile Color and Luminance

NOTICE

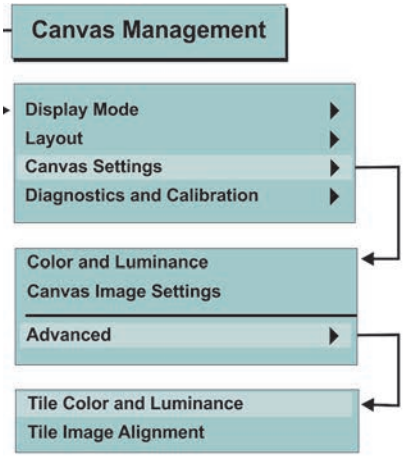
MicroTiles are designed for automatic image alignment and color matching. Overriding individual settings is not recommended and should only be performed following proper training.

The advanced features of tile color and luminance enables advanced users to manually adjust color uniformity.

1. To access the Tile Color and Luminance screen, select the **Canvas Management** menu and then **Canvas Settings > Advanced > Tile Color and Luminance**.
2. Ensure tiles are selected. To do this either click **Select All**, or select the tiles manually from the **Tile Schematic** section of the screen. Hold the **Shift** key down to make multiple selections.
3. Click **Clear** to turn the display white.
4. Ensure the tiles are in OSD mode. For details, refer to *Select a Display Mode* on page 47.
5. Click **Identify**. A black dot will appear on each of the selected tiles.
6. Adjust the RGB and luminance settings as needed, using the scroll bars or the arrow keys.
7. Click **Apply** to see the changes take effect. The first time you attempt to apply values to multiple tiles a confirmation alert message appears requiring you to enter text to confirm this action. This text confirmation is only required once - otherwise just an acknowledgment is required.

Confirmation Alert
You are applying these settings to MULTIPLE tiles which will overwrite thier current settings.
This change is NOT reverseable.
Are you sure you wish to continue?
To Confirm this action please type CONFIRM into the text box. Text is case sensitive.
OK
Cancel

8. If necessary, click **Reset** to return the values to the default settings.



Advanced: Tile Image Alignment

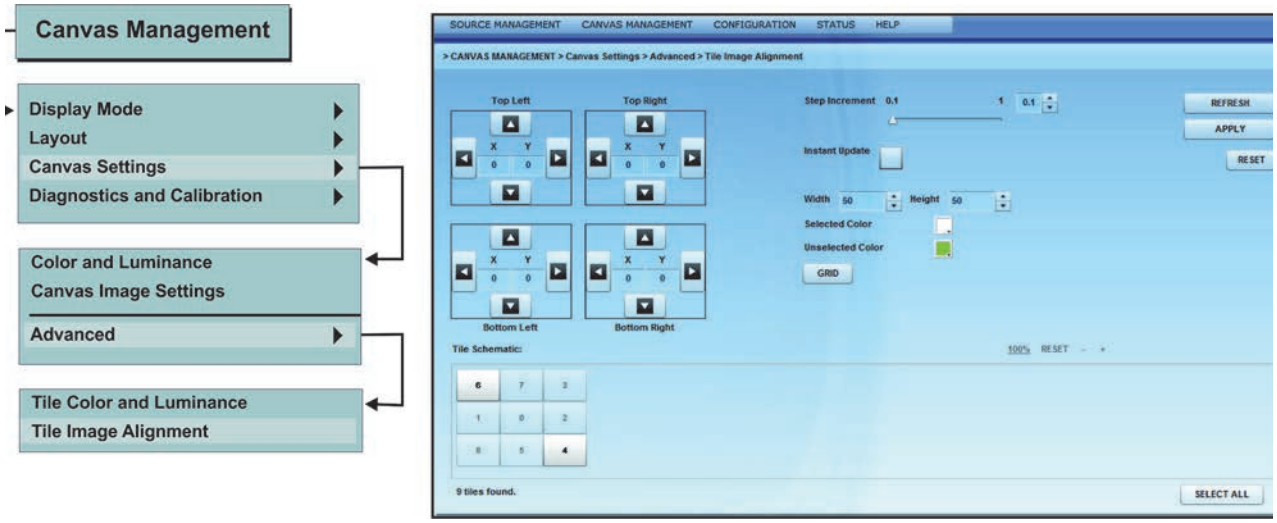
This screen enables advanced users to manually correct image alignment.

NOTICE Applying extreme tile image alignment values may corrupt the video display in some MicroTiles. To resolve this issue, reduce the image alignment adjustment values.

1. To access the Tile Image Alignment screen select **Canvas Management > Canvas Settings > Advanced > Tile Image Alignment**.
2. Select the specific tiles. Either click **Select All** or use your mouse to click individual tiles within the Tile Schematic section of the screen. Hold the **Shift** key down to make multiple selections.
3. Click **Grid** to display the test pattern. The array will display the selected tiles and unselected tiles in the colors specified.
4. Click the arrow buttons or use keyboard controls to adjust the XY offsets of the top-left, top-right, bottom-left and bottom-right values. Note that the Step Increments scroll bar allows you to customize how much the XY offsets will adjust. XY adjustment values are limited to -10 and +10.
5. Use the **Instant Update** feature to immediately send value changes to the ECU, otherwise you will need to click **Apply** each time you make changes. Note that if you have selected multiple tiles the warning message illustrated below appears. You will only need to enter the text confirmation the first time you attempt to apply values to multiple tiles. Any other changes applied still bring up the warning message; however, you will only need to click OK.

Confirmation Alert
You are applying these settings to MULTIPLE tiles which will overwrite thier current settings.
This change is NOT reverseable.
Are you sure you wish to continue?
To Confirm this action please type CONFIRM into the text box. Text is case sensitive.
OK
Cancel

6. Click **Reset** at any time to return to the default settings.



Display a Test Pattern

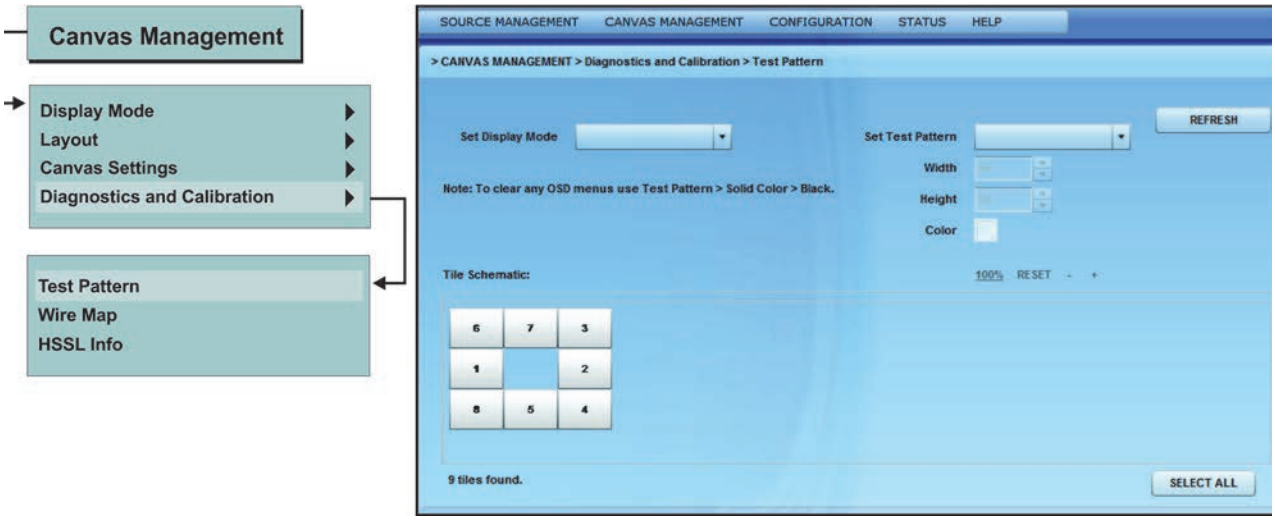
The Test Pattern screen allows users to select from a list of test patterns used for troubleshooting and setup purposes.

1. From the **Canvas Management** menu select **Diagnostics and Calibration > Test Pattern** to access the Test Pattern screen.
2. Click on a particular tile in the **Tile Schematic** section to apply the change to a specific tile only or click **Select All**.
3. From the **Set Display Mode** list, select from **Video**, **OSD** or **OSD (Unscaled with Overscan)**. In order to display internal test patterns, **Display Mode** must be set to **OSD** or **OSD (Unscaled with Overscan)**.

   OSD is the preferred mode if checking mechanical alignment (or electronic geometry alignment).
4. From the **Set Test Pattern** list, select which type of test pattern to display. Choices include: **Solid Color, Color Bars**, **Grayscale**, **Checkerboard**, **Checkerboard Inverted**, **Grid**, **13 Point Optical**.

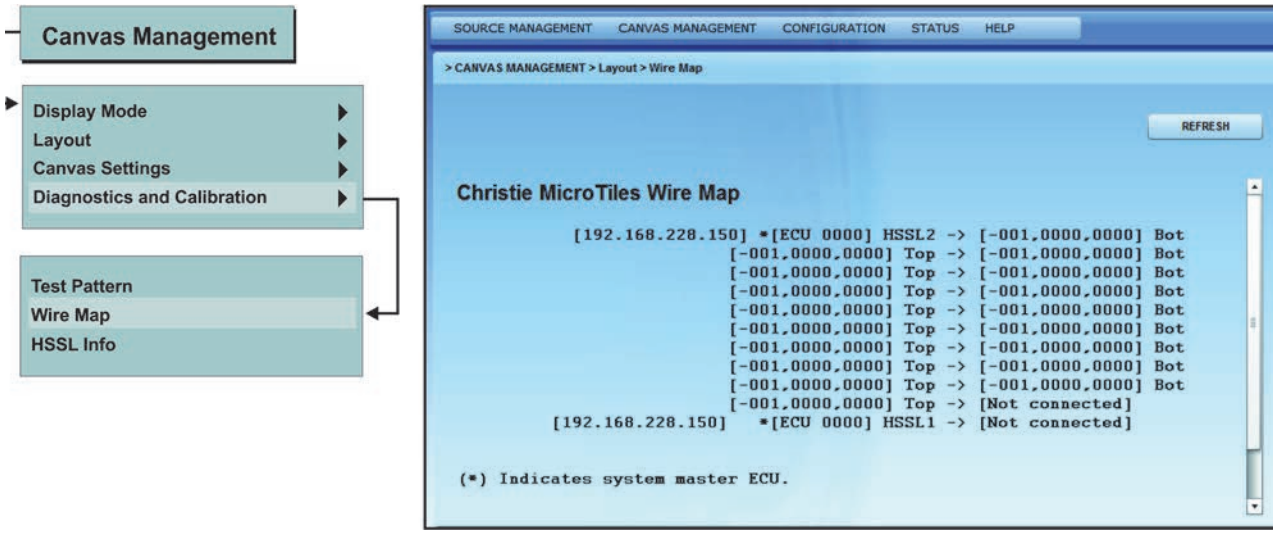
   When using the Solid Color test pattern, select a specific color to use from the Color fly-out menu.
5. If necessary, adjust the width and height of the test pattern by clicking on the up/down arrow keys or enter a specific value in the designated fields.

   Width and height values are only valid for the Checkerboard, Checkerboard Inverted and Grid test patterns.
6. To return to displaying video content, ensure **Video** is selected from the **Set Display Mode** list.



Wire Map

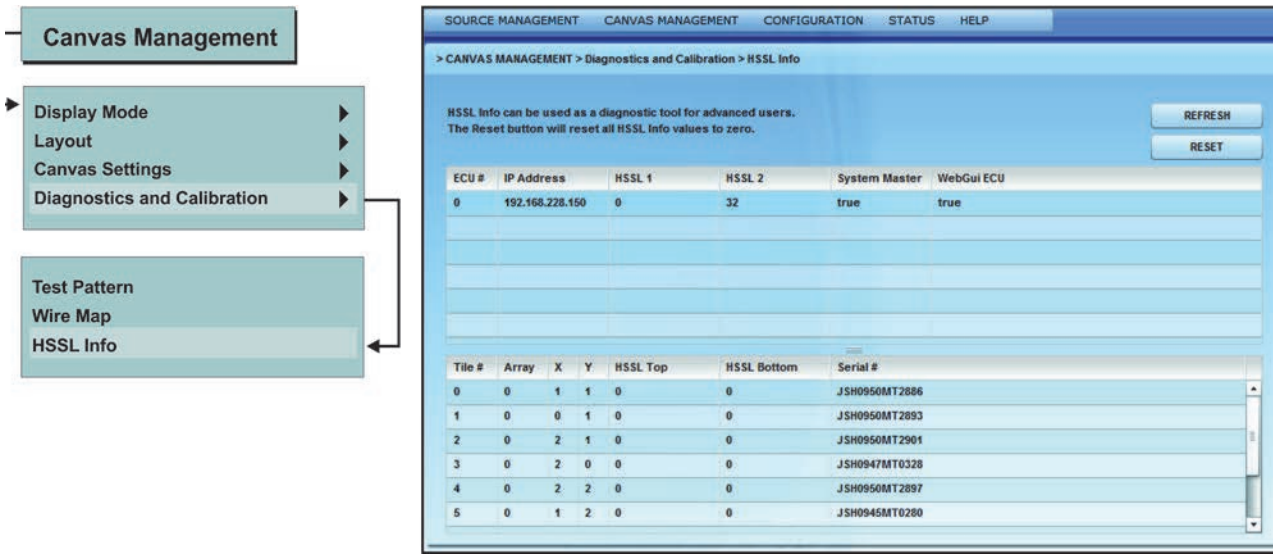
This screen displays a wire map of the array in textual form.



HSSL Info

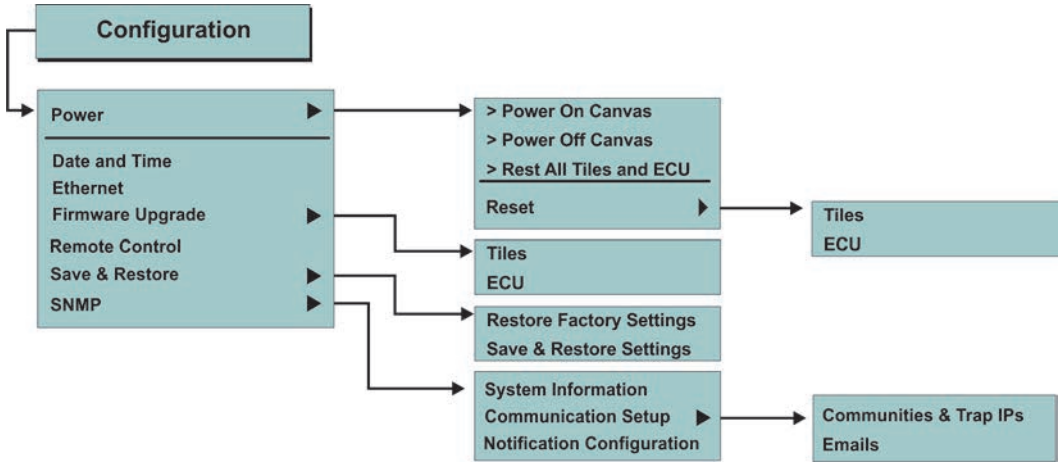
This screen displays the link quality for ECU HSSL1 and HSSL2. HSSL information can be used as a diagnostic tool for advanced users.

The Serial number field now displays the light engine serial number instead of the MicroTile display unit serial number.


Canvas Management
Display Mode
Layout
Canvas Settings
Diagnostics and Calibration
Test Pattern
Wire Map
HSSL Info
SOURCE MANAGEMENT
CANVAS MANAGEMENT
CONFIGURATION
STATUS
HELP
> CANVAS MANAGEMENT > Diagnostics and Calibration > HSSL Info
HSSL Info can be used as a diagnostic tool for advanced users.
The Reset button will reset all HSSL Info values to zero.
REFRESH
RESET
ECU # | IP Address | HSSL 1 | HSSL 2 | System Master | WebGui ECU
0 | 192.168.228.150 | 0 | 32 | true | true
Tile # | Array | X | Y | HSSL Top | HSSL Bottom | Serial #
0 | 0 | 1 | 1 | 0 | 0 | JSH0950MT2886
1 | 0 | 0 | 1 | 0 | 0 | JSH0950MT2893
2 | 0 | 2 | 1 | 0 | 0 | JSH0950MT2901
3 | 0 | 2 | 0 | 0 | 0 | JSH0947MT0328
4 | 0 | 2 | 2 | 0 | 0 | JSH0950MT2897
5 | 0 | 1 | 2 | 0 | 0 | JSH0945MT0280

Configuration Menu

This menu allows users to enable/disable power to the canvas, reset the tiles and ECU, upgrade the firmware, and update the date and time.



Power ON/OFF All Tiles

Selecting **Power ON Canvas** and **Power OFF Canvas** affects the entire array, regardless of how many tiles have been selected through the firmware application.

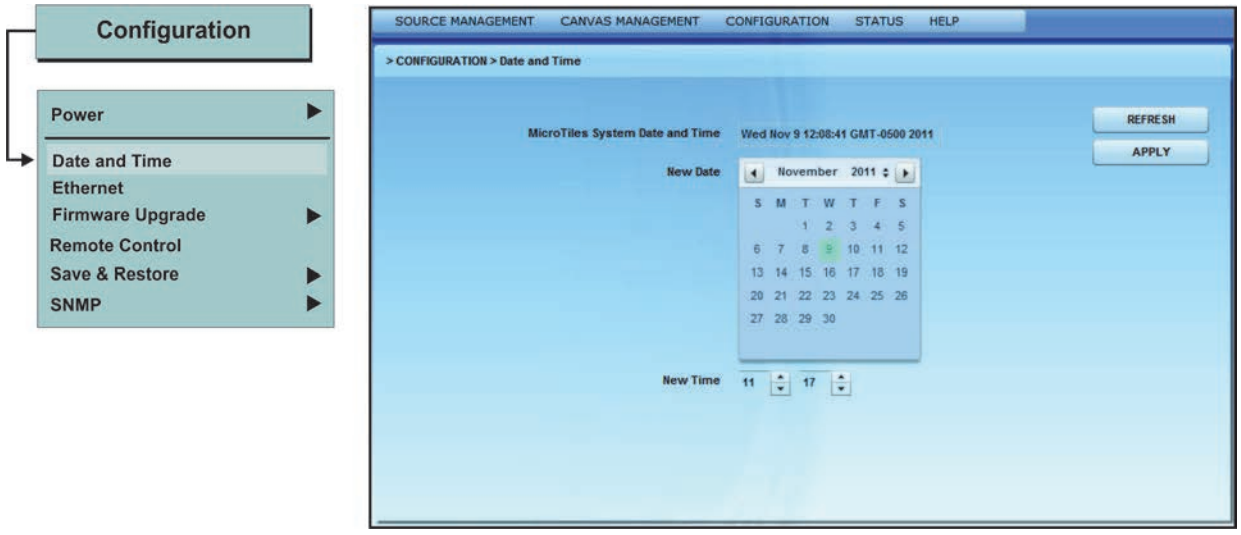
Wait approximately 10 seconds between powering the canvas OFF and ON.

Resetting Selected Tile(s) and ECU(s)

The tiles and ECU(s) must be reset after a firmware upgrade in order for changes to take effect. This function affects the tiles that have been selected through the WebUI. It is highly recommended that you reset all tiles and the ECU. For more information, see *Upgrading Main Firmware* on page 60.

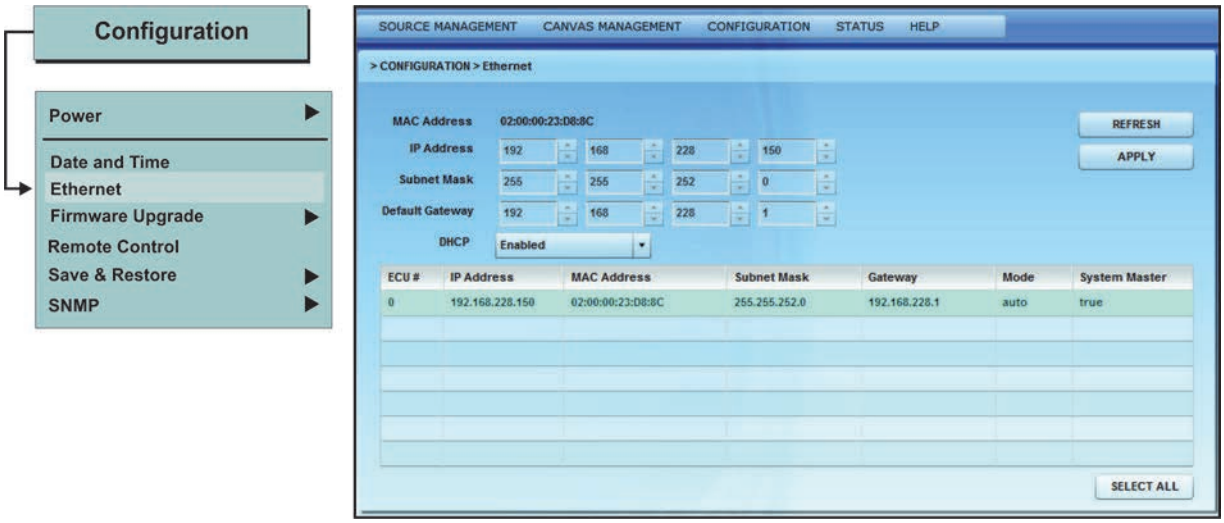
Set Date and Time

To access this screen select **Configuration** from the top menu bar and **Date and Time**. This screen allows users to set the current system date and time. The date displayed in the **MicroTiles System Date and Time** field is processed from the ECU, while the date in the **New Time** field is updated to the time on the computer. If needed, click **Refresh** to see changes take effect and click **Apply** to store the changes.



Configuring Ethernet

This screen displays the network settings for each of the ECUs. To manually enter an IP address disable the DHCP feature.



Upgrading Main Firmware

Read the following points before upgrading the main firmware:

- Before updating the firmware, check online at www.christiedigital.com to ensure the latest firmware version is installed. Failure to install the latest version can affect system performance.
- Ensure the ECU and MicroTile(s) firmware versions match.

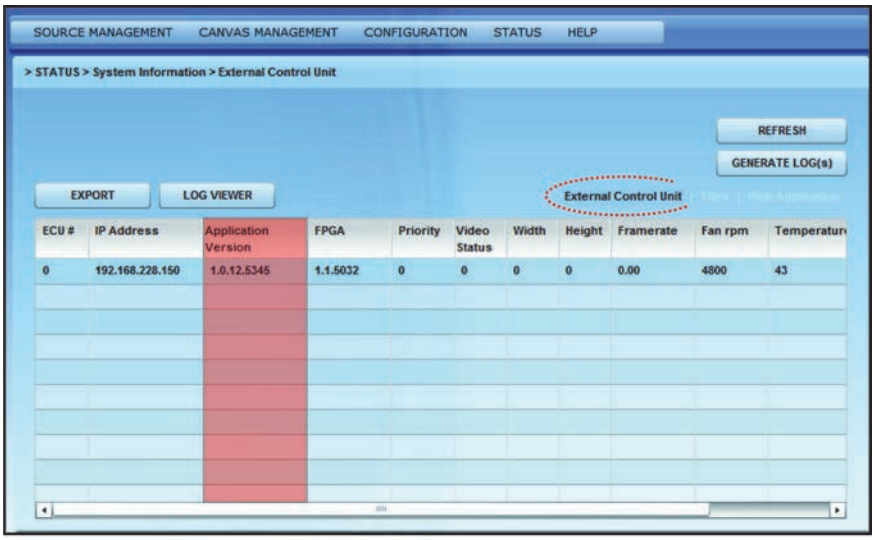
- During a firmware upgrade, the web server becomes unresponsive for several minutes and video may be interrupted or temporarily disabled.
- During a firmware upgrade do not attempt to use the OSD, the WebUI or open another web browser.
- Firmware upgrades take approximately 35 minutes to complete. If you are using Windows®, Adobe® Flash Player™ Plug-In version 9.0, must be installed in order to initiate the upgrades. Adobe® Flash Player Plug-In™ version 10.0 or higher is required if you are using Mac® or Linux®.
- It is recommended that the FPGA hardware upgrade be performed at the same time as a firmware upgrade. For more information, see *Correcting a Failed Firmware Upgrade* on page 64.

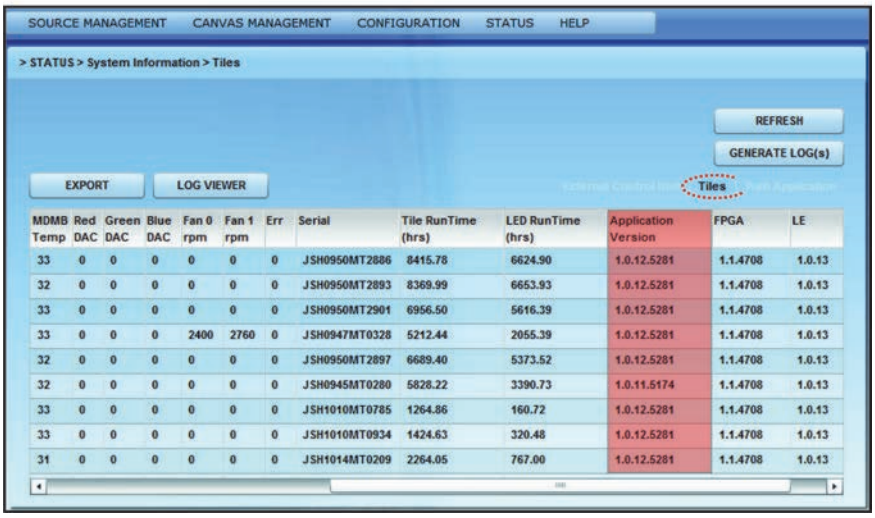
Check Current Firmware Version from OSD

1. Press **Menu** on the R100 Remote Control to access the OSD.
2. From the **OSD Main Menu**, select **Status**.
3. From the **Status** menu, select either **External Control Unit** or **Tiles** to view the current firmware versions installed. Ensure the firmware versions match. For details, see *OSD Status Menu* on page 39.
4. Go to www.christiedigital.com to check for the latest available firmware version. If the version found on the web does not match the version on the product ensure the web browser cache is cleared and complete the steps in *Upgrade Firmware* on page 62.

Check Current Firmware Version from WebUI

1. Select **Status** from the top menu bar and then **System Information**.
2. From the System Information screen, select either **External Control Unit** or **Tiles** to view the current firmware version installed. The current version is displayed in the spreadsheet under **Application Version**.
3. Go to www.christiedigital.com to check for the latest available firmware version. If the version found on the web does not match the version on the product, complete the steps in *Upgrade Firmware* on page 62.


SOURCE MANAGEMENT
CANVAS MANAGEMENT
CONFIGURATION
STATUS
HELP
> STATUS > System Information > External Control Unit
REFRESH
GENERATE LOG(s)
EXPORT
LOG VIEWER
External Control Unit
ECU # | IP Address | Application Version | FPGA | Priority | Video Status | Width | Height | Framerate | Fan rpm | Temperatur
0 | 192.168.228.150 | 1.0.12.5345 | 1.1.5032 | 0 | 0 | 0 | 0 | 0.00 | 4800 | 43



Upgrade Firmware

NOTICE

If an error message about duplicate tile addresses is displayed, reset the array before attempting a firmware upgrade.

1. Download the latest firmware from www.christiedigital.com and save it to a computer that will be connected to the array for the upgrade.
2. Open the WebUI.
3. Click **Configuration > Firmware Upgrade** and select either **Tiles** or **ECUs**.

Users can choose to upgrade the firmware or hardware for a group of selected tiles or an ECU. For information on hardware upgrades, see *Correcting a Failed Firmware Upgrade* on page 64.

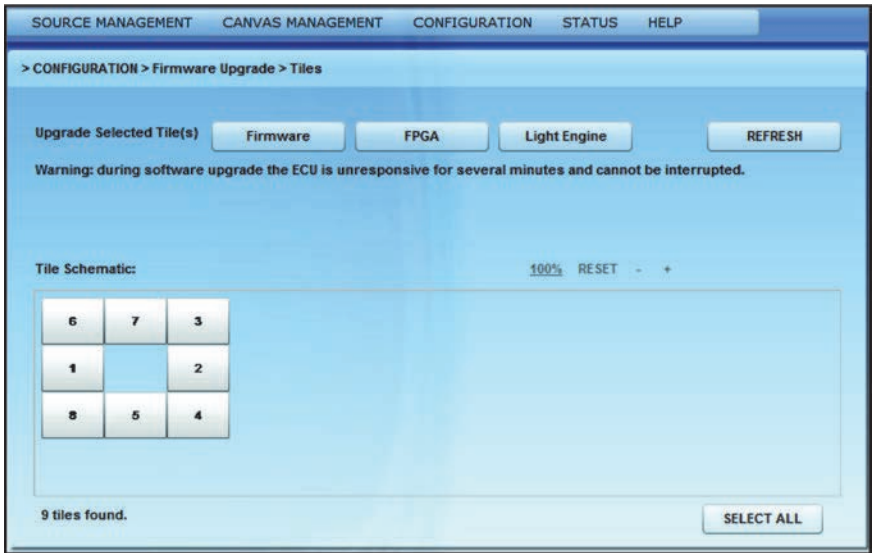
4. Upgrade the MicroTiles firmware:

Begin with the firmware upgrade and then perform the FPGA upgrade. For details on the FPGA upgrade, see *Correcting a Failed Firmware Upgrade* on page 64.

a. In the **Tile Schematic** area, select the tiles to upgrade or click **Select All**.

b. Click **Firmware** and browse to the location of the firmware upgrade file on the computer.

c. Once the upgrade has been completed, reset the tiles to make sure the new upgrades are active. To reset the tiles select **Configuration > Power > Reset > Tiles**.



5. Upgrade the Light Engine:

NOTICE

Do not initiate a light engine upgrade unless an upgrade is posted at www.christiedigital.com. Light engine upgrades take approximately 35 minutes for 100 connected tiles.

a. From the **Configuration > Firmware Upgrade > Tiles** screen, to upgrade the firmware for the light engine in all of the selected tiles, select **Light Engine**.

b. Reset all tiles to complete the upgrade and make sure the light engine firmware is active. To reset the tiles select **Configuration > Power > Reset > Tiles**.

6. Upgrade the ECU firmware:

- The ECU firmware upgrade takes approximately one hour for every 10 connected ECUs.
- Begin with the firmware upgrade and then the FPGA upgrade. For details on the FPGA upgrade, see *Correcting a Failed Firmware Upgrade* on page 64.

a. Select the desired ECU from the spreadsheet or click **Select All**.

b. Click **Firmware** and then locate the firmware upgrade file on the computer.

c. When the upgrade is complete, select **Configuration > Power > Reset > ECUs**.

If the web browser does not recognize the new WebUI application from the ECU, clear the web browser cache.

Correcting a Failed Firmware Upgrade

On ECUs using firmware version 1.0.10 or older, when attempting to simultaneously upgrade the firmware for a MicroTiles canvas with a large number of ECUs, the upgrade may fail. Complete the following steps to correct this issue.

1. Update the master ECU to the latest firmware version.
2. Reset all ECUs.
3. Upgrade the firmware on all other ECUs.
4. Upgrade the firmware on all MicroTiles.
5. Reset all ECUs.
6. Reset all MicroTiles.
7. Click **Status > System Information** and verify the **Application Version** field reflects the upgrade.

NOTICE

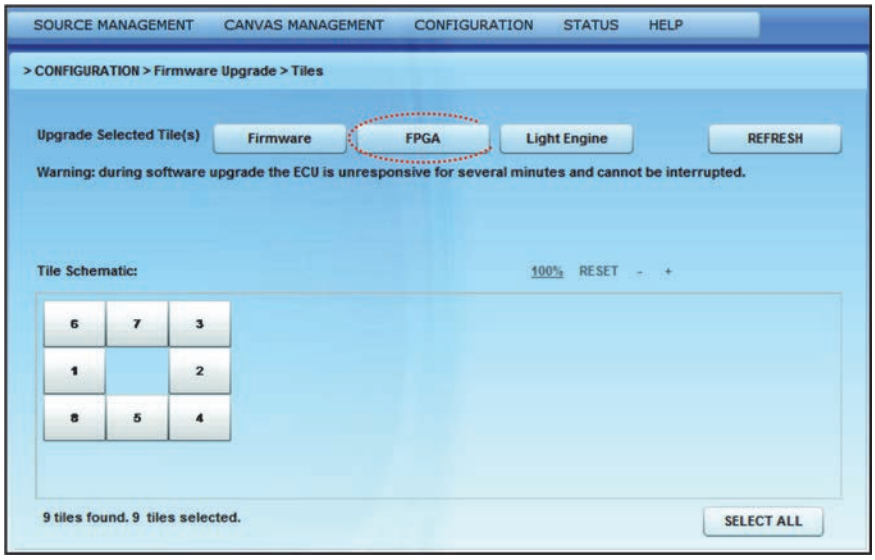
The **Reset All Tiles and ECUs** selection is not available until all MicroTiles and ECU(s) are upgraded to the latest firmware version. During the initial upgrade, use **Configuration > Power > Reset > ECUs**.

Hardware Upgrades

Upgrading the Field Programmable Gate Array (FPGA)

It is recommended that the FPGA hardware upgrade be performed at the same time as a firmware upgrade.

1. Upgrade the MicroTiles FPGA:
    a. From the WebUI, select **Configuration** from the top menu bar and then **Firmware Upgrade > Tiles**.
    b. Select **FPGA** and then locate the firmware upgrade file on your PC. Click **Open** to initiate the upgrade.
    c. **FPGA** hardware upgrades take approximately three minutes to complete for a single tile or 35 minutes for 100 connected tiles. Adobe™ Flash Player Plug-In version 9.0, must be installed in order to initiate upgrades if you are using Windows. Adobe™ Flash Player Plug-In version 10.0 or higher is required if using Mac or Linux.
    d. To complete the upgrade reset the ECU. To reset the ECU select **Configuration** from the top menu bar and then **Power > Reset > ECUs**.



2. Upgrade the ECU FPGA:
    a. From the WebUI, select **Configuration** from the top menu bar and then **Firmware Upgrade > ECUs**.
    b. Select **FPGA** and then locate the firmware upgrade file on your PC. Click **Open** to initiate the upgrade.

Remote Control

Remote Pairing via the WebUI

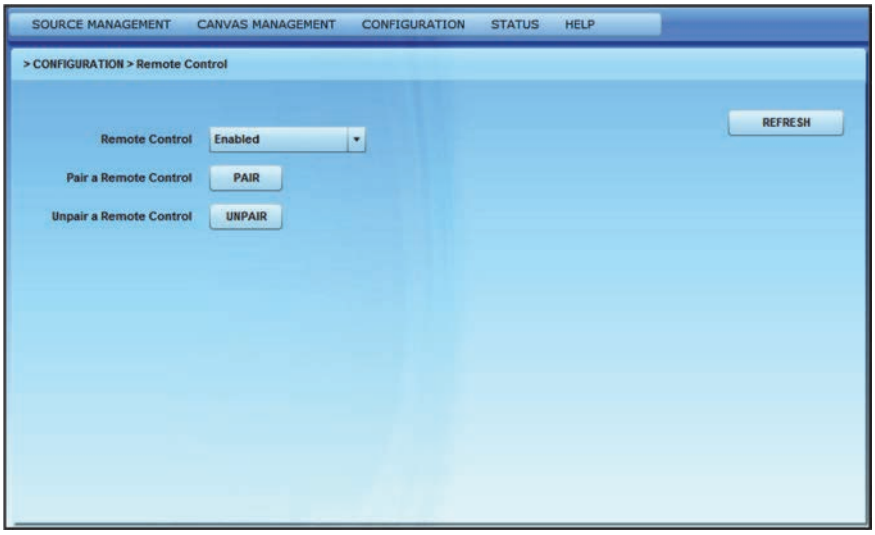
Remote pairing is useful when you are unable to physically access the ECU.

NOTICE

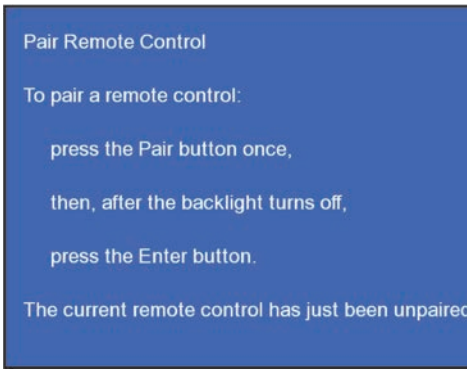
- Only one remote can be paired to the master ECU.
- Pairing does not function with slave ECUs.

1. From the **Configuration** menu, click **Remote Control**.

2. Select **Enabled** from the **Remote Control** list before you pair or unpair the remote. Click **Pair**. These settings are disabled by default.



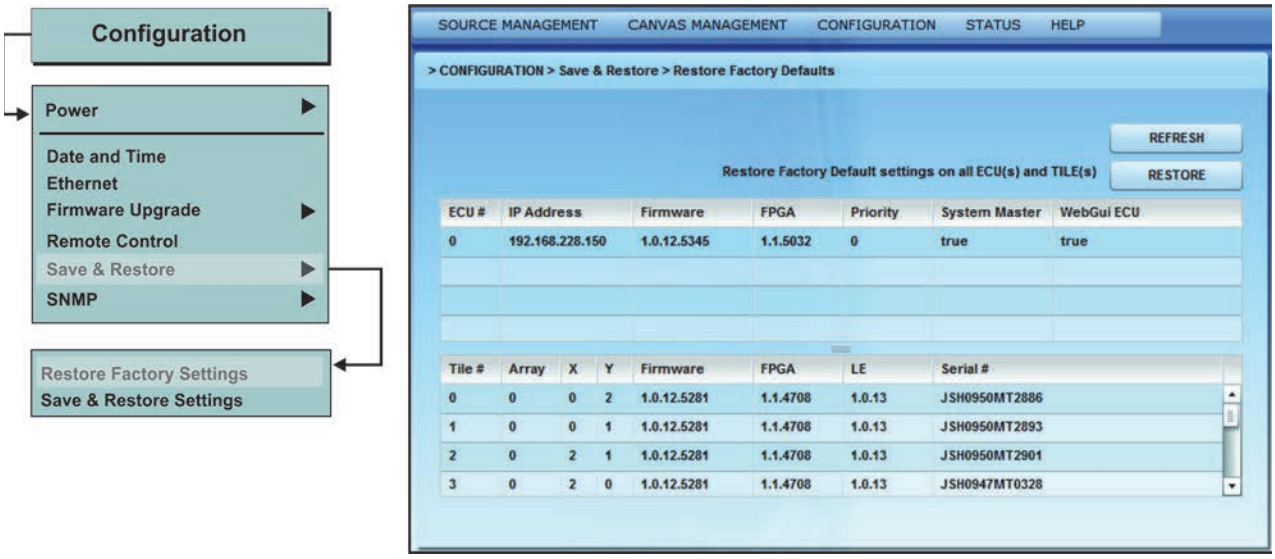
3. The Pair Remote Control screen appears on the OSD.


Pair Remote Control
To pair a remote control:
press the Pair button once,
then, after the backlight turns off,
press the Enter button.
The current remote control has just been unpaired

4. Press the **Pair** button from the R100 Remote Control and then press **Enter**.
5. The message `The remote control is now paired` appears on each tile in the array once the process is complete. To return to video, press **Exit** on the remote.
6. To unpair the remote, click the **Set** button beside the **Unpair** setting from the Remote Control screen.

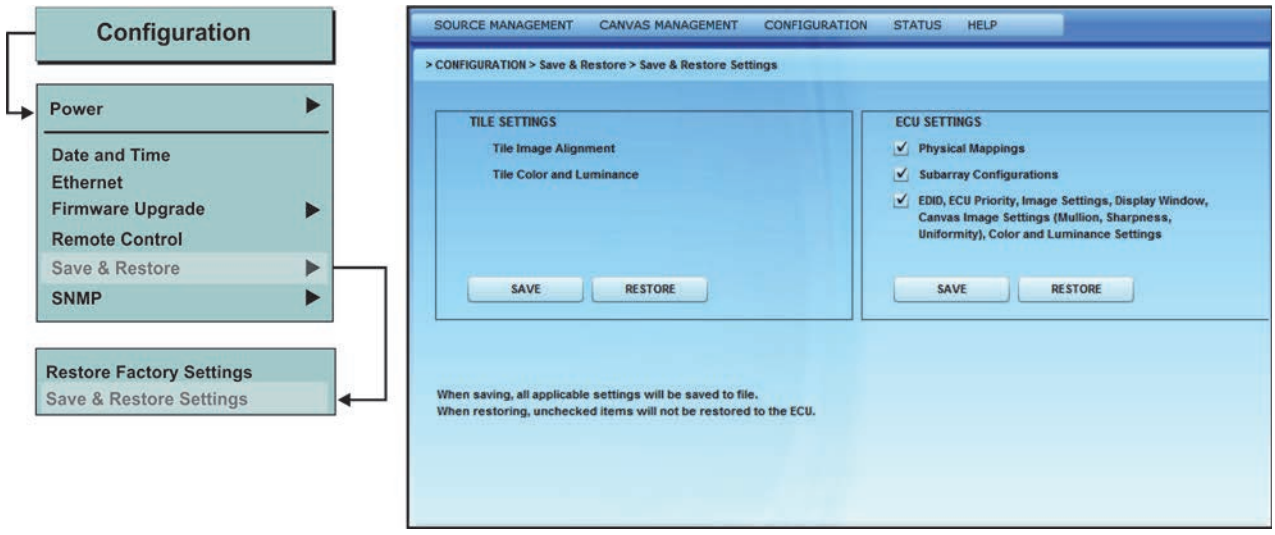
Restore Factory Defaults

This screen is used to reset the ECU(s) and tile(s) back to their default settings. This is typically done when setting up a new configuration or when swapping master ECUs from one configuration to another. To restore factory defaults, select one or multiple ECU(s) and/or tile(s) from the spreadsheet and click **Restore**.


Configuration
Power
Date and Time
Ethernet
Firmware Upgrade
Remote Control
Save & Restore
SNMP
Restore Factory Settings
Save & Restore Settings
SOURCE MANAGEMENT
CANVAS MANAGEMENT
CONFIGURATION
STATUS
HELP
> CONFIGURATION > Save & Restore > Restore Factory Defaults
REFRESH
Restore Factory Default settings on all ECU(s) and TILE(s)
RESTORE
ECU # IP Address Firmware FPGA Priority System Master WebGui ECU
0 192.168.228.150 1.0.12.5345 1.1.5032 0 true true
Tile # Array X Y Firmware FPGA LE Serial #
0 0 0 2 1.0.12.5281 1.1.4708 1.0.13 JSH0950MT2886
1 0 0 1 1.0.12.5281 1.1.4708 1.0.13 JSH0950MT2893
2 0 2 1 1.0.12.5281 1.1.4708 1.0.13 JSH0950MT2901
3 0 2 0 1.0.12.5281 1.1.4708 1.0.13 JSH0947MT0328

Save & Restore Settings

This screen enables you to save specific settings files for both the tiles and ECUs. Click **Save** to download and save the specific settings file. Click **Restore** to upload a saved settings file to the ECU. For the tile settings the **Save** and **Restore** functions are applied to all settings all the time. For the ECU settings the **Save** function saves all settings all the time; however, the **Restore** function only restores the options that are selected.

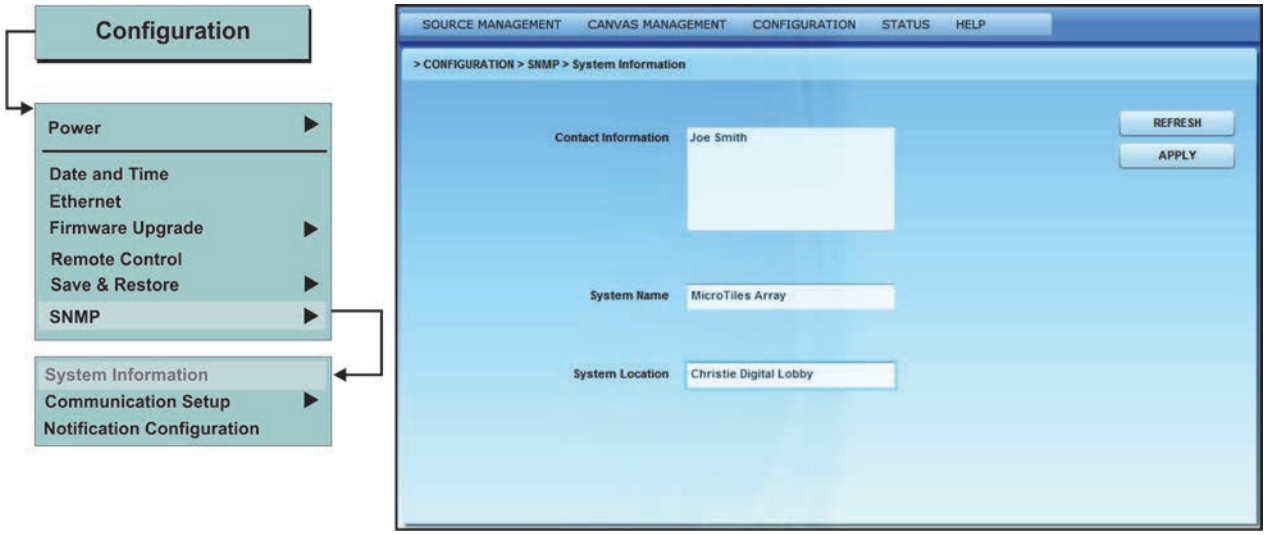


Simple Network Management Protocol (SNMP)

SNMP enables network administrators to monitor their network devices from a single location. The MicroTiles SNMP application enables you to monitor one or more MicroTiles installations. The following section outlines the SNMP WebUI configuration options. For information on the MicroTiles Object Identifiers (OIDs), refer to the MIB files.

SNMP System Information

The System Information screen contains the system information settings; which includes **Contact Information**, **System Name** and **System Location**. If necessary, click **Refresh** to query the system for the current settings. When making any changes always click **Apply** to save the settings. Note that the **Contact Information** field can accommodate a maximum of 128 characters, and the **System Name**/**System Location** fields can accommodate 32 characters.



SNMP Communication Setup

Setting up SNMP communication includes specifying the SNMP community strings and trap IP addresses that the MicroTiles installation will send traps to. For details, see *Communities and Trap IPs* on page 68.

It also enables users to define up to three Email addresses where notification Emails for the events that are setup through the Notification Configuration screen are sent to. For details, see *Emails* on page 69 and *Notification Configuration* on page 69.

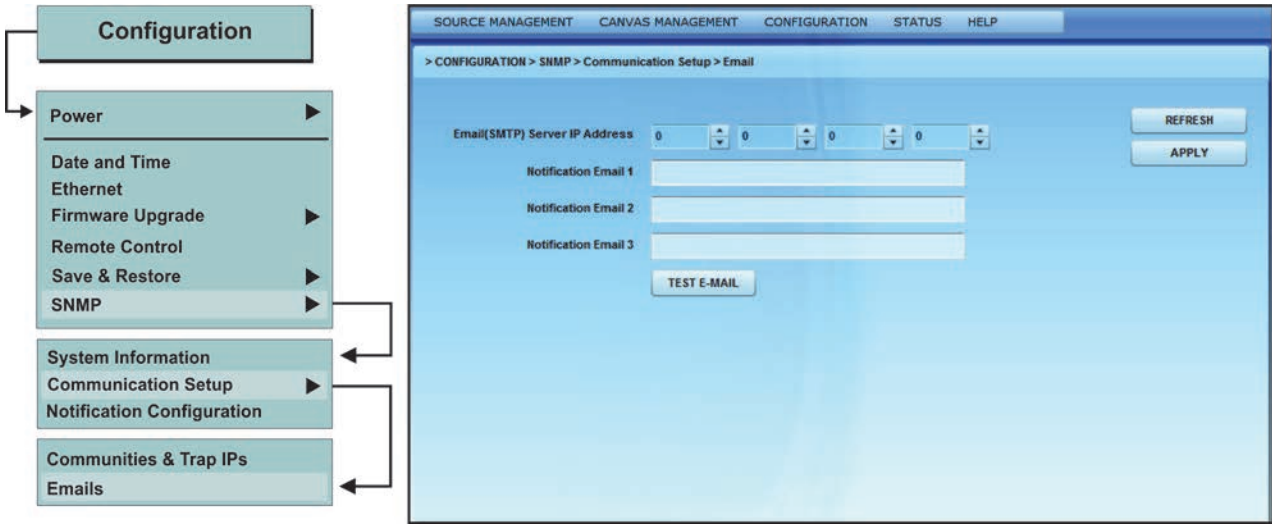
Communities and Trap IPs

The default setting for **SNMP Read Community** and **SNMP Trap Community** is **private**. Both fields accommodate a maximum of 32 characters. Up to three trap IP addresses can be configured. Traps are SNMP specific notifications about an event that has occurred in the system. Traps sent by the SNMP daemon to the SNMP network administrator(s) indicate that specific events occurred. For information about the events that can be selected to trigger SNMP traps, see *Notification*

Configuration on page 69.

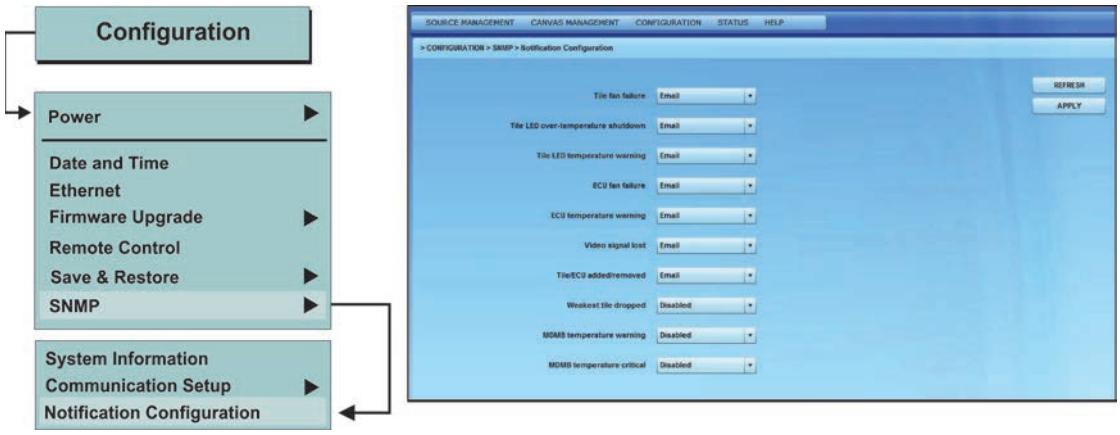
Emails

This screen enables users to define the IP address of the SMTP Email server and specify up to three Email addresses to deliver notifications if specific events occur. For information on the events that can be selected to trigger Email notifications, see *Notification Configuration* on page 69.



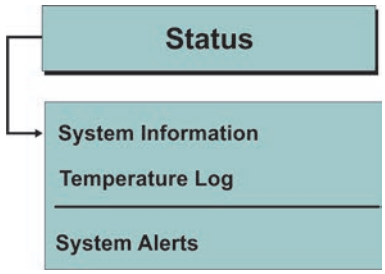
Notification Configuration

The Notification Configuration screen contains the seven events, which users can select from in order to receive Email notifications, trap notifications, or both trap and Email notifications. For information on how to troubleshoot your system should any of these events occur, see *Troubleshooting* on page 77.



Status Menu

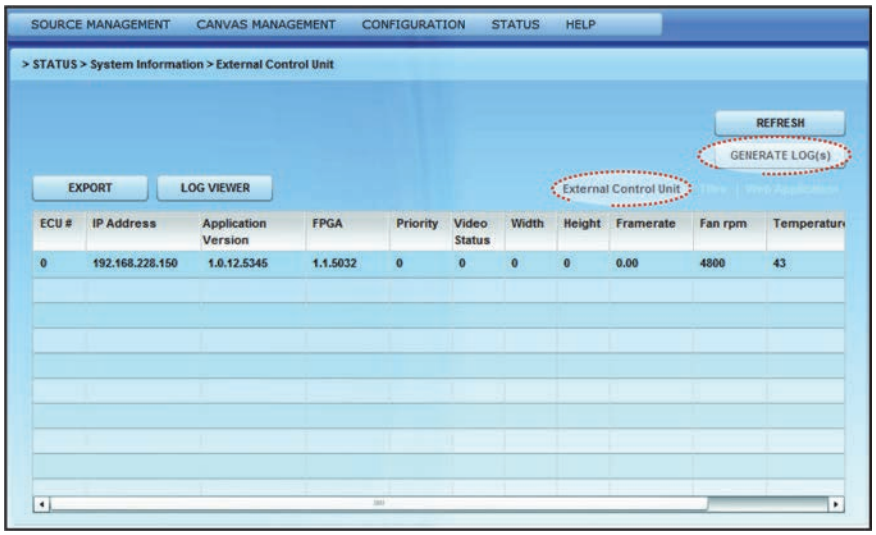
The Status menu allows users to view the system information for the web application, ECU and the tiles. It also provides a breakdown of the current system alerts. For information on the most common alerts and how to troubleshoot, see *Troubleshooting* on page 77.



System Information - ECU

This screen provides firmware version information for the ECU. The ECU spreadsheet lists information on all the ECUs connected to the master ECU. For information on how to upgrade the firmware, see *Upgrading Main Firmware* on page 60.

1. Click **Status > System Information** from the top menu bar.
2. Select **External Control Unit** from the available screen selections. Each of the master and slave ECUs connected to the array are listed in the spreadsheet. The master ECU will always state **true** in the **System Master** column. Whichever ECU you are currently logged into will appear highlighted in the spreadsheet.
3. Select the ECU from the spreadsheet and click **Generate Log(s)**.



4. To view the ECU logs click, **Log Viewer**. This will populate a new window in Windows® Explorer containing the master ECU error logs, which are used for technical support to troubleshoot any problems occurring with the master ECU.

System Information - Tiles

1. Select **Status > System Information** from the top menu bar.
2. Select **Tiles** from the available screen selections. The spreadsheet that appears provides users with system status information for each of the tiles used in the array. Users are able to gain information on either the brightness values of the LED sensors, runtime values and CRC values of the selected tile by selecting a **Tile #** from the spreadsheet section and by clicking the **Read** buttons above the spreadsheet.

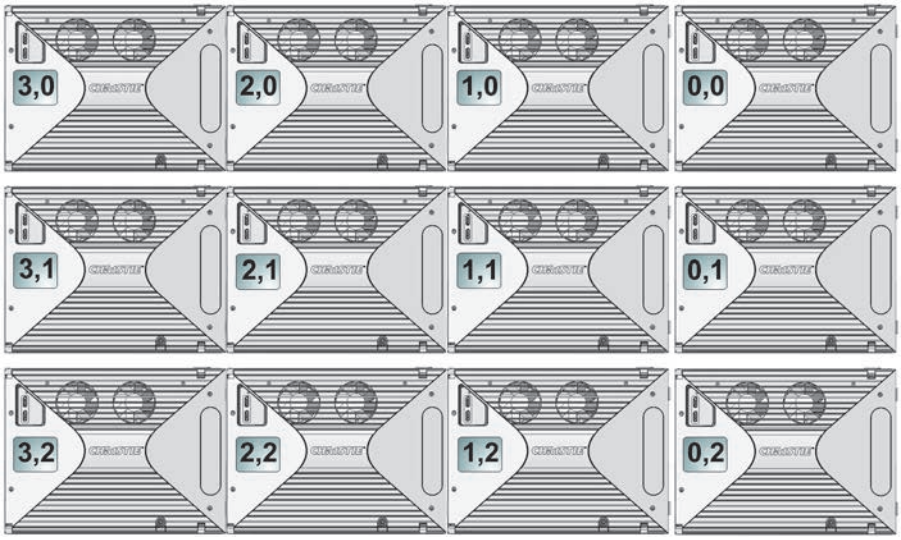
   Click **Read All** to import each of the features simultaneously.
3. The **Tile Spreadsheet** displays the specific operating information for each tile used in the array.

Tile Spreadsheet Features

- **Tile #:** Number of the tile in the array.
- **Array:** Array number, where multiple arrays are controlled from one ECU.
- **XY:** XY coordinates of the tile in the array. Arrays are counted in the XY-axis, starting from the top-left corner of the array.
- **Temperatures:** Current temperature settings for the LEDs, the FEB and formatter. If any of the three LEDs reaches its maximum temperature tolerance, the LED drive levels will dim the tiles gradually, until the minimum LED drive level is reached. If the temperature remains hot, upon reaching the minimum drive level, the light engine shuts down. The tiles remain ON and continue to communicate with the ECU.
- **Red/Green/Blue DAC:** Indicate the drive levels of the LEDs.

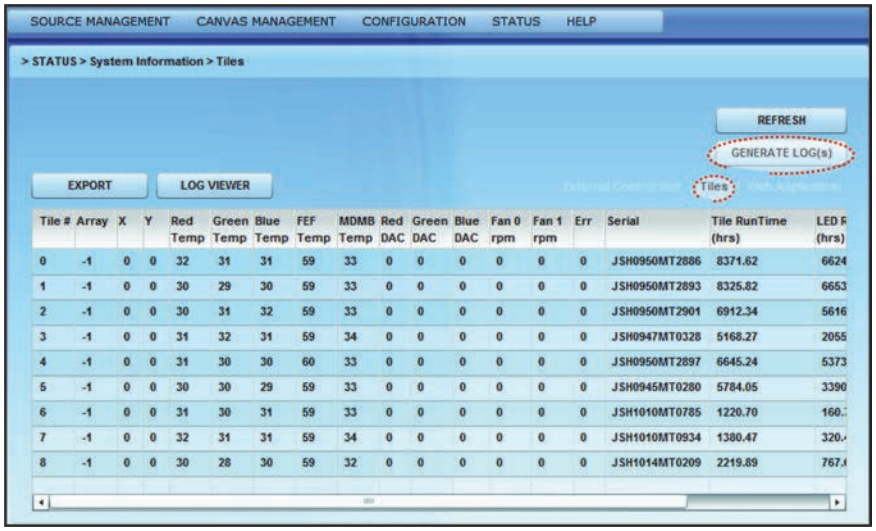
- **Fan 0/Fan 1:** Current speed for both fans. The lower the speed and quieter the fans are running.
- **Err:** Displays the number of errors associated with the particular tile.
- **Serial:** Internal light engine serial number for the tile.
- **Tile RunTime:** Displays the number of runtime hours for the particular tile.
- **LED RunTime:** Displays the number of LED runtime hours.

Tile Numbering Sequence (Back View)



- **Application Version:** Displays the current version of firmware installed.
- **FPGA/LE:** Internal serial number for FPGA and light engine.
- **Dropped Status:** Displays whether or not the tile has been ignored when determining overall canvas brightness.
- **Tile#:** Displays the numbering sequence of each tile.

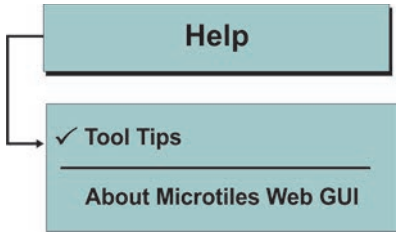
4. Select the tile(s) from the spreadsheet and click **Generate Log(s)**.



5. To view the tile logs click, **Log Viewer**. This will populate a new window in Windows® Explorer containing the master tile error logs, which are used for technical support to troubleshoot any problems occurring with the tile(s).

Help Menu

When **Tool Tips** is disabled, the rollover menu tips throughout the firmware application are disabled. Select **About MicroTiles Web GUI** to view firmware information.



Maintenance

Installers and all other users must maintain a safe operating environment at all times. Read through this section in its entirety and understand all warnings and precautions before attempting to operate the Christie MicroTiles. For additional information, see the *Christie® MicroTiles™ Service Manual (P/N: 020-100332-xx)* and the *Christie® MicroTiles™ Specification and Application Guide (P/N: 020-100334-xx)*.

Cleaning Procedures

⚠CAUTION It is critical the array be powered OFF and disconnected from AC power before the lens or any of the covers are loosened or removed. Maintaining the cleanliness of all internal components during any service procedure is critical. A MINIMUM amount of cleaning, if any, is required during and after servicing.

Cleaning Inside Screen Surface

Applies to S100, S200, and S300/S310

Use a dry, clean, soft cloth with a low lint count to remove any specks from the back of the Fresnel. If absolutely necessary, use clean, filtered compressed air to remove any loose particles.

Typically, dirt on the back of the Fresnel appears as a defect on the screen.

Cleaning Outside Screen Surface

Specific to S100 and S300/S310

To clean the front surface of the S100, S300, or S310 screen, spray Windex™ or an equivalent window cleaner onto a clean cloth and gently wipe the screen surface. Use a dry, clean, soft cloth to remove any streaks. DO NOT spray cleaner directly onto the screen surface. If absolutely necessary, use clean, filtered compressed air to remove any loose particles.

Specific to S200

NOTICE Avoid using window cleaning sprays, kitchen scouring compounds, solvents such as acetone, gasoline, benzene, alcohol, carbon tetrachloride or lacquer thinner. These can scratch and deteriorate the screen surface.

To remove light dust from the front surface of the S200 screen use a feather duster or similar. For heavier dirt –stains from fingers etc – wash the surface with a mild soap solution in lukewarm water, using a clean, soft cloth with a low lint count. Use a dry, clean, soft cloth to remove any streaks.

Lens

⚠CAUTION The projection lens should never be handled. DO NOT attempt to clean with commercial cleaners, such as Windex™ or equivalent cleaners.

The projection lens should never need to be cleaned; however, if it is absolutely necessary, use compressed air to remove any loose particles.

Light Engine Heat Sinks

NOTICE If airflow to the heat sinks is restricted they will begin to overheat. Firmware is designed to reduce the brightness of the tiles when this occurs to ensure the temperature remains level. If they continue to overheat the firmware eventually turns the LEDs OFF to prevent damage.

In dusty environments check the heat sinks regularly to ensure airflow is not restricted. If needed, blow off dust using filtered, compressed air. The light engine must be removed to access the heat sinks. For more information, see the *Christie® MicroTiles™ Service Manual (P/N: 020-100332-xx)*.

Air Filter

In dusty environments check the filters monthly, otherwise check them every three to four months. If needed, blow off dust using filtered, compressed air. For information on how to remove the air filter, see the *Christie® MicroTiles™ Service Manual (P/N: 020-100332-xx)*.

Troubleshooting

If the firmware or the tiles themselves do not appear to be operating properly, note the symptoms and use the following section for assistance. If the problem cannot be resolved, contact your dealer/service representative.

Image problems

Problem	Solution
Video signal is lost	Check the DVI connections for the following: • The DVI connection has been removed or is loose. • The ECU is defective. • The DIV source is powered off (no DVI sync). If the lost signal is due to a failed ECU, call technical support at 1-800-221-8025.
Tiles are flickering	Ensure the latest firmware is installed. For details see *Upgrading Main Firmware* on page 60.
Video is not displaying	Possible causes: • The array is operating in OSD mode. • The firmware version installed on the ECU and the tiles may not be the same. • The pixel limitations have been exceed. • There is a problem with the source. Solutions: • Ensure all tiles are selected • Ensure the array is operating in Video mode. To turn on Video mode, access the WebUI and select **Canvas Management > Display Mode > Video (All Tiles)**. • Ensure the firmware on both the ECU and tiles match. For details, see xxxx • Change the resolution. For details, see • Check to see if the ECU is registering a DVI source: 1. From the WebUI, select **Source Management > Size and Position**. 2. Under the **System Master Input Source Properties** section, the **DVI Clock Detected** input should state **True**. If the input is reading **false**, check the connection between the ECU and the video source and try again.

Problem	Solution
Color matching is not working	Possible causes: • Color matching is not enabled. • There is a problem with the version of firmware installed. • The light engine is defective. Solutions: • Enable color matching: 1. From the WebUI click **Canvas Management > Canvas Settings > Color and Luminance**. 2. From the **Automatic Color Matching** list select **ON (Recommended)**. • Update to the latest firmware version. Before updating the firmware, check online at www.microtiles.com to ensure the latest firmware version is installed. Failure to install the latest version can affect system performance. For more information, see *Upgrading Main Firmware* on page 60. • Replace the light engine. For details on light engine replacement, see the *Christie® MicroTiles™ Service Manual (P/N: 020-100332-xx)*. If light engine replacement still does not correct the problem the tile is defective and needs to be repaired. Contact technical support at 1-800-221-8025.
Image Replicated on each MicroTile in the Array	Possible causes: • Automatic array configuration is not enabled. • The XY offsets of the array are not set correctly. Solutions: To enable the automatic array configuration 1. From the WebUI, select **Canvas Management > Layout > Configure**. 2. Ensure **Automatic Array Configuration** is set to **Enabled**. 3. To force an array reconfiguration manually, click **Reconfigure Array**. For details, see *Automatic Array Configuration* on page 51. To set the XY offsets 1. From the WebUI, select **Source Management > Size and Position**. 2. Set the X-Offset to **0**, the Y-Offset to **0**, the X-Width to **1**, and the Y-Width to **1** (the default settings). 3. Ensure the display window is set correctly. For details, see *Advanced: Tile Image Alignment* on page 56.
Extra pixels/ghosting	Sharpness setting is too high. Set sharpness to ~.50. For details, see *Canvas Image Settings* on page 54

Hardware errors

Problem	Solution
One or more tiles do not power up	Power cycle the entire array using the switch on the power bar. If the power cabling is accessible, power cycle the failing tile (and any tiles downstream from it) by disconnecting the daisy train and try to power up the tile again.

Problem	Solution
Fan failure	A fan failure likely occurs if the fan is defective or degraded, or if the fan connector is loose. If the fan is defective or has degraded over time please contact technical support at 1-800-221-8025.
LED over-temperature shutdown	Caused by either insufficient cooling or a fan failure. Collect logs of the failed tiles and contact technical support at 1-800-221-8025. For more information on the LEDs, see *Status Indicators* on page 30.
LED temperature warning	If any of the three LEDs reaches its maximum temperature tolerance, the LED drive levels will dim the tiles gradually, until the minimum LED drive level is reached. If the temperature remains hot, upon reaching the minimum drive level, the light engine shuts down. The tiles remain ON and continue to communicate with the ECU.
Tile/ECU added or removed	Possible causes: • HSSL removed • Defective tile • Power loss or power regained Solution: Check to ensure the ECU display port cable is properly connected to the HSSL-1 and HSSL-2 ports on the back of the tile. If the tile is defective, contact technical support at 1-800-221-8025.

WebUI Errors

Problem	Solution
Cannot assign IP address using DHCP static IP assignment	The IP address range 192.168.1.xxx is reserved and used internally by the ECU. Assign another IP address outside of this range; for example, 192.168.3.xxx.
Cannot connect to WebUI	• Ensure the network configuration on your computer is set up correctly. If it is and you still cannot connect, try a different computer. • Reset the ECU. If the problem still persists, the ECU is defective and needs to be repaired. Contact technical support at 1-800-221-8025.
System not responding	If the alert, “Web GUI timed out waiting for response. Please try again.” appears, it indicates the ECU is busy either handling input detection, handling active image inputs, or monitoring tiles, etc. Wait a few seconds and try again.
Unmapped tiles found	If the alert, “Warning, unmapped tiles were found” appears along the top of the window it indicates the ECUs detected unmapped tiles on initial start-up. Waiting a minute after seeing video should clear this error; however, if it remains, complete the following steps: 1. Select **Canvas Management** from the top menu bar and then **Layout > Configure**. 2. Ensure **Automatic Array Configuration** is **Enabled**. 3. Click **Reconfigure Array**.

CHRISTIE

Specifications

Due to continuing research, specifications are subject to change without notice.

General Specifications

Specification		Value
Model numbers	Display unit	D100
	Screen	S300/S310
	External Control Unit (ECU)	E100
	Remote Control	R100
Display unit dimensions	Height	306 mm (12.05 in.)
	Width	408 mm (16.06 in.)
	Depth	260 mm (10.24 in.)
	Weight with S300/S310 screen	9.2 kg (20.3 lbs)
	Weight without S300/S310 screen	8.0 kg (18.7 lbs)
ECU dimensions	Height	50 mm (1.97 in.)
	Width:	259 mm (10.20 in.)
	Depth	191 mm (7.52 in.)
	Weight	1.6 kg (3.5 lbs)
Display	Screen size (diagonal)	510 mm (20 in.)
	Native resolution per tile	720 x 540
	Pixel pitch	0.567 mm x 0.567 mm
	Maximum calibrated brightness:	600 Nits (cd/m2)
	LED lifespan (50% brightness):	65,000 hours
	Peak white color temperature:	6500K
	Adjustable gamma	Yes
	Color space (CIE 1931)	115%
	Optical system	DLP® 0.55” SVGA

	Specification	Value
Processing and control	Input signal compatibility	Single-link DVI
	Processor bit rate	165M pixels per second
	Data link bit rate	5 Gbps
	Maximum video bandwidth	165M pixels per second
	Color depth	24 bits per pixel
	Color processing	13 bits
	Refresh rate	47-63Hz frame-locked
	Control interface:	Ethernet, USB 2.0, Serial
Power	Christie MicroTiles Display Unit D100 input rated	100-220V, 50/60Hz
	Maximum nine Christie MicroTiles on a single circuit (10A total)	
	Power consumption per tile	70W typical
	Heat load per tile	239 BTUs/hr typical
	ECU power consumption	8.5W typical/11.5W maximum
Operation	Operating temperature with S300/S310 screen:	S300: 5°C to 40°C (41°F to 104°F) S310: 5°C to 35°C (41°F to 95°F)
	Relative humidity with S300/S310 screen	35-85% non-condensing
	Minimum clearance for ventilation	50mm (2 in.)
	Altitude	0ft (0m) to 10,000ft (4000m)
	Vibration/motion limit	0.5G
	Sound pressure per tile:	35 dB at 25°C (77°F) ambient typical
	Runtime	24/7
Accessories	Mounting brackets with each tile above five rows high (optional)	
	Base feet for leveling the bottom row (optional)	
Regulatory approvals	Directives (EC) 2002/95/EC (RoHS); 2002/96/EC (WEEE); Regulation (EC) No. 1907/2006 (REACH)	
	CAN/CSA C22.2 No. 60950-1-03 2nd Edition	
	UL 60950-1, 2nd Edition	
	IEC 60950-1:2001, 2nd Edition	
	FCC, Part 15, Subpart B, Class A	
	EN55022/CISPR22 Class A	
	EN55024/CISPR24	
Limited Warranty	Two years parts and labor. Contact an authorized Christie representative for full details.	

Screen Specifications

Specification	S310	S300	S100 (Discontinued)	S200 (Discontinued)
Weight	1.2 kg	1.2 kg	1.2 kg	1.2 kg
Maximum calibrated brightness	600 Nits	600 Nits	800 Nits	400 Nits
Operating temperature	5°C (41°F) minimum 35°C (95°F) maximum	5°C (41°F) minimum 40°C (104°F) maximum	5°C (41°F) minimum 40°C (104°F) maximum	17°C (63°F) minimum 31°C (89°F) maximum
Non-operating temperature	2°C (36°F) minimum 50°C (122°F) maximum	2°C (36°F) minimum 50°C (122°F) maximum	2°C (36°F) minimum 50°C (122°F) maximum	2°C (36°F) minimum 31°C (89°F) maximum
Operating relative humidity	35 – 80% non-condensing	35 – 80% non-condensing	35 – 80% non-condensing	40 – 60% non-condensing
Shipping (boxed) temperature	-20°C (-4°F) minimum 50°C (122°F) maximum	-20°C (-4°F) minimum 50°C (122°F) maximum	-20°C (-4°F) minimum 50°C (122°F) maximum	-20°C (-4°F) minimum 31°C (89°F) maximum

Advanced Specifications

In *General Specifications* on page 81, specifications are based on a typical canvas of tiles operating at maximum brightness with color and brightness matching enabled. This is regarded as the default or typical operating condition for a MicroTiles canvas. The following table provides additional specifications under a broader range of operating conditions. Maximum power (110W) is the maximum power of a tile with all LEDs manually driven to the maximum levels (for example, no color matching).

Operating Condition	Item	Specification
Typical: At maximum brightness with color and brightness matched.	Power Consumption per Tile	70W
	Heat Load per Tile	239 BTUs/hr
	Sound Pressure per Tile	35 dB at 25°C (77°F) ambient
Maximum: At maximum brightness, with every LED at maximum drive level, sacrificing color and brightness matching between tiles.*	Power Consumption per Tile	110W
	Heat Load per Tile	375 BTUs/hr
	Sound Pressure per Tile	45 dB at 25°C (77°F) ambient

*A MicroTiles canvas is designed to achieve color and brightness matching between tiles by adjusting the drive levels of each LED in the canvas. Through this continuous process, the maximum brightness and color space of a complete canvas is lower than that of an individual tile. Operating a MicroTiles canvas without color and brightness matching enabled is not recommended.

OSD Menu Tree

Source Management Menu Structure

Canvas Management Menu Structure

Configuration, Status, and Help Menu Structures

000-101825-12
ASSY TECH DOCS MicroTiles

Corporate offices

USA – Cypress
ph: 714-236-8610

Canada – Kitchener
ph: 519-744-8005

Consultant offices

Italy
ph: +39 (0) 2 9902 1161

Worldwide offices

Australia
ph: +61 (0) 7 3624 4888

Brazil
ph: +55 (11) 2548 4753

China (Beijing)
ph: +86 10 6561 0240

China (Shanghai)
ph: +86 21 6278 7708

Eastern Europe and
Russian Federation
ph: +36 (0) 1 47 48 100

France
ph: +33 (0) 1 41 21 44 04

Germany
ph: +49 2161 664540

India
ph: +91 (080) 6708 9999

Japan (Tokyo)
ph: 81 3 3599 7481

Korea (Seoul)
ph: +82 2 702 1601

Republic of South Africa
ph: +27 (0)11 510 0094

Singapore
ph: +65 6877-8737

Spain
ph: + 34 91 633 9990

United Arab Emirates
ph: +971 4 3206688

United Kingdom
ph: +44 (0) 118 977 8000